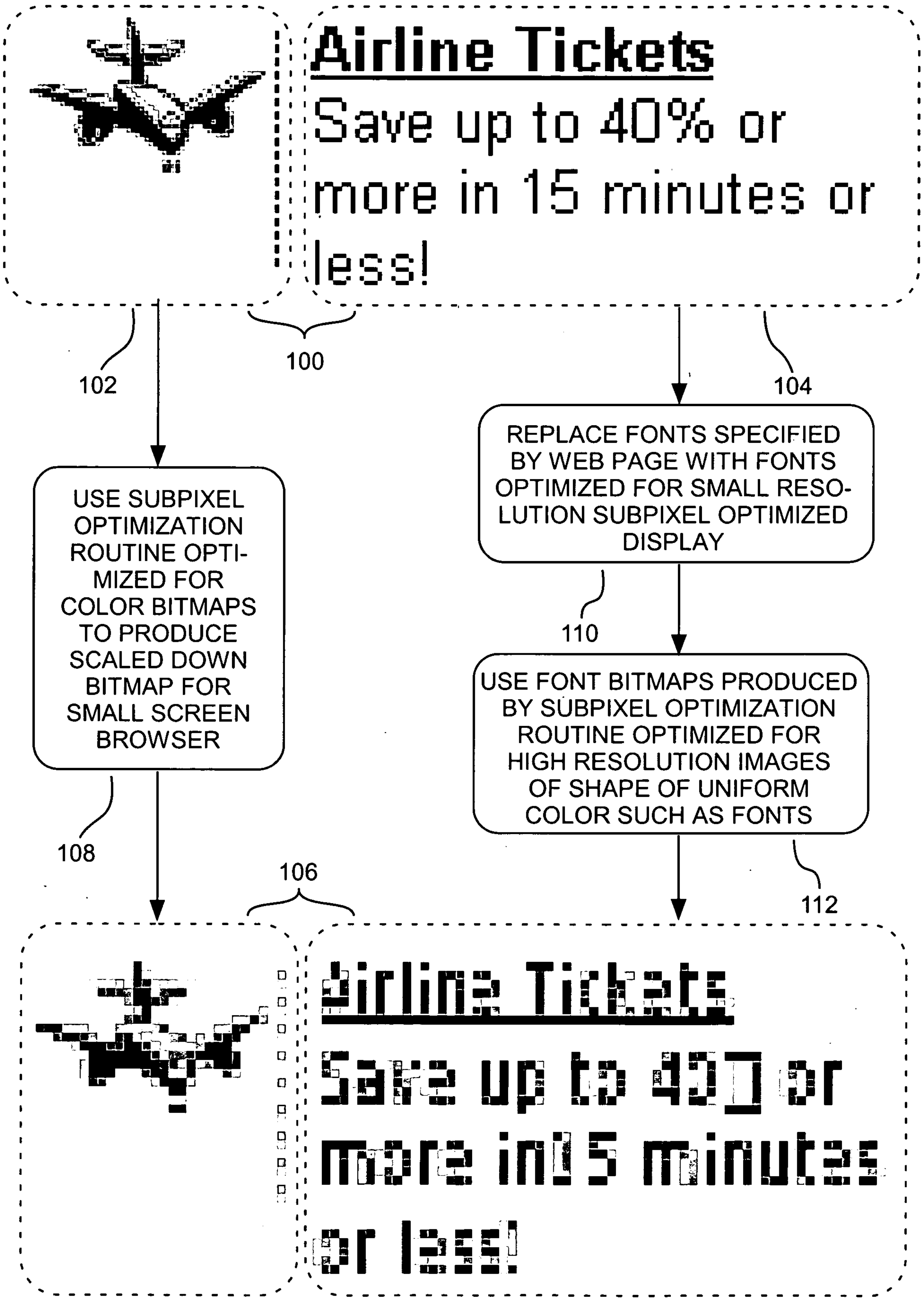


Airline Tickets
Save up to 40% or more in 15 minutes or less!
100
102
104
USE SUBPIXEL OPTIMIZATION ROUTINE OPTIMIZED FOR COLOR BITMAPS TO PRODUCE SCALED DOWN BITMAP FOR SMALL SCREEN BROWSER
REPLACE FONTS SPECIFIED BY WEB PAGE WITH FONTS OPTIMIZED FOR SMALL RESOLUTION SUBPIXEL OPTIMIZED DISPLAY
110
USE FONT BITMAPS PRODUCED BY SUBPIXEL OPTIMIZATION ROUTINE OPTIMIZED FOR HIGH RESOLUTION IMAGES OF SHAPE OF UNIFORM COLOR SUCH AS FONTS
108
106
112
Airline Tickets
Save up to 40% or more in 15 minutes or less!

FIG. 1

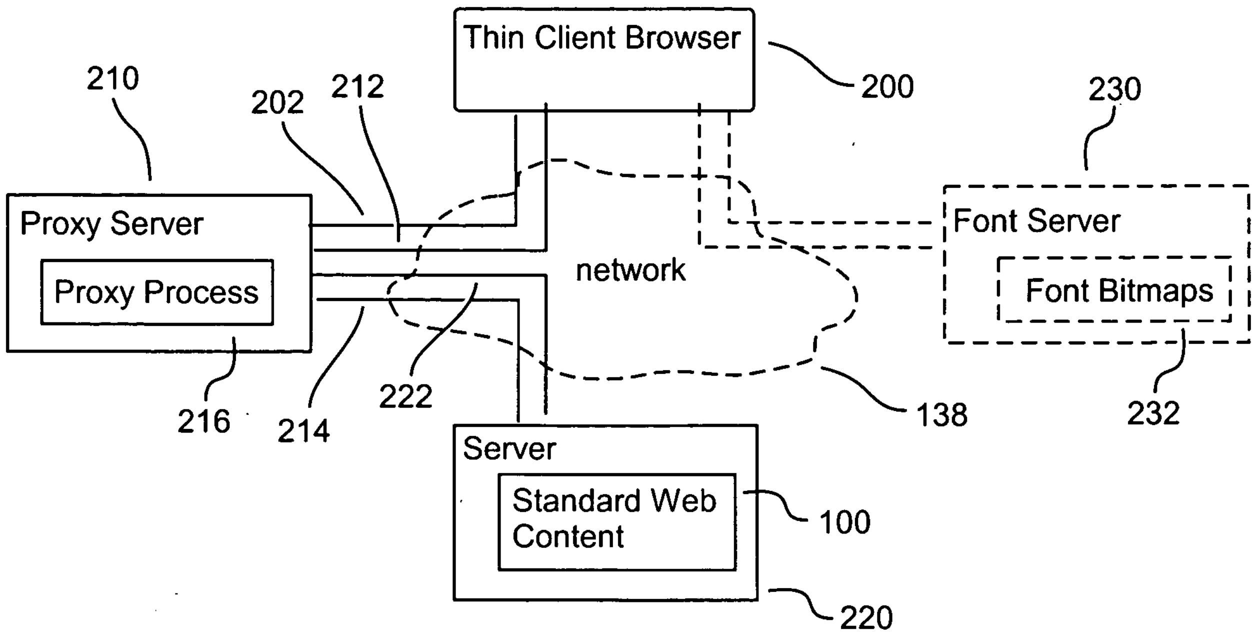


FIG. 2

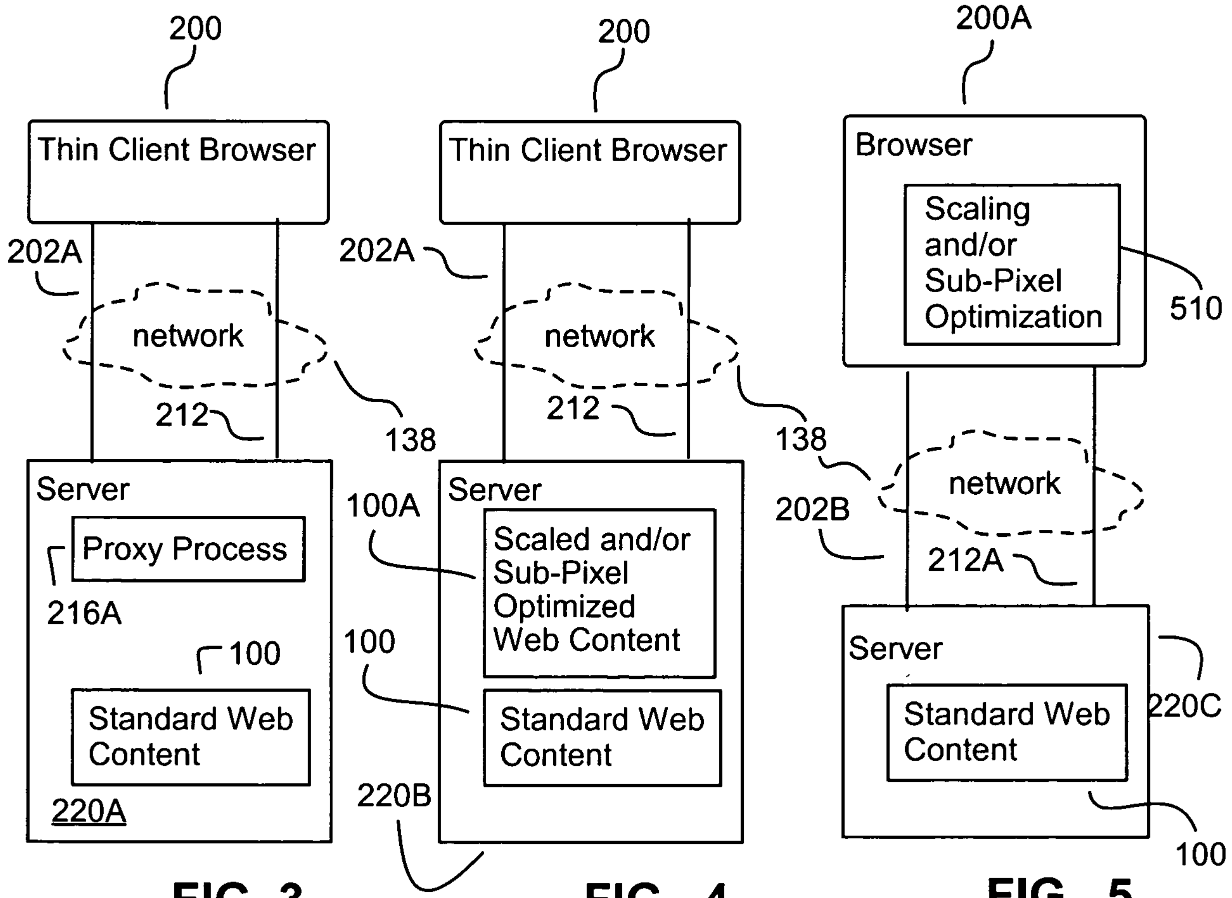


FIG. 3

FIG. 4

FIG. 5

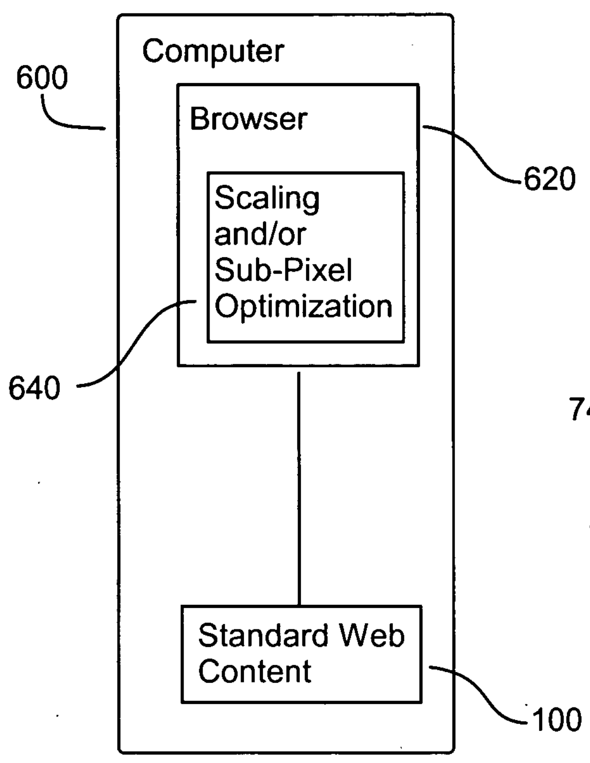


FIG. 6

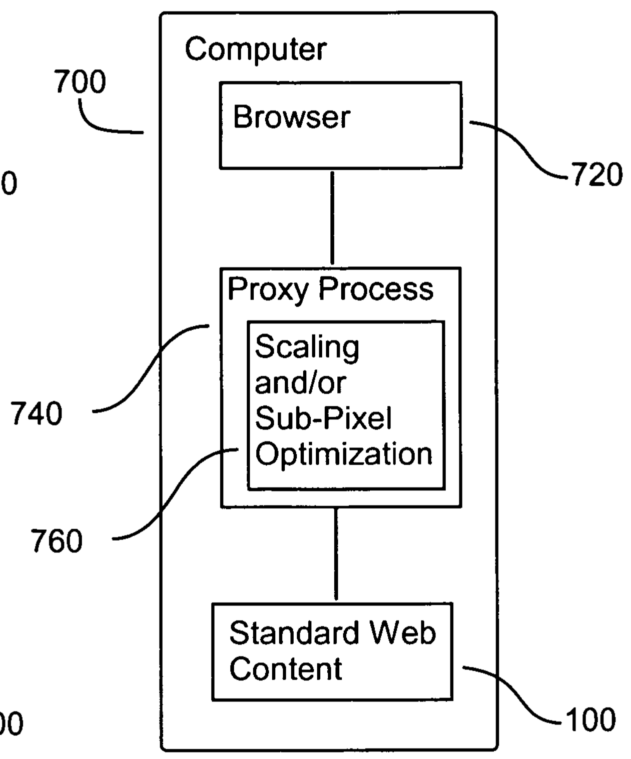


FIG. 7

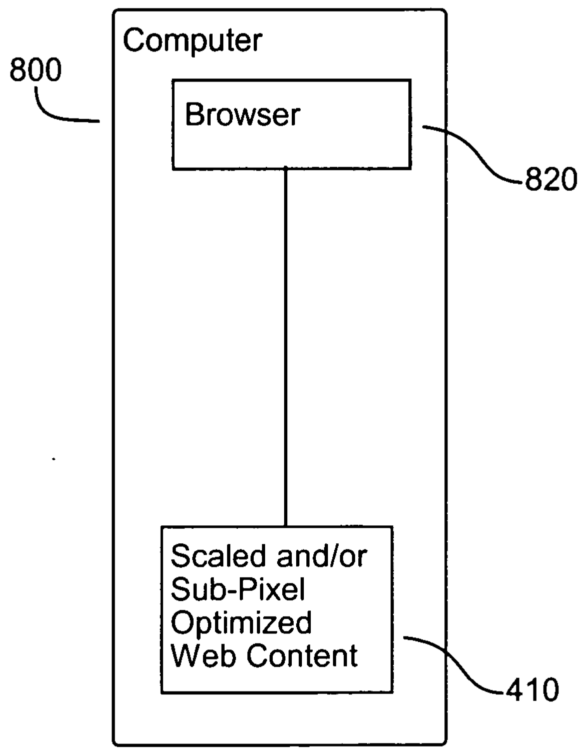


FIG. 8

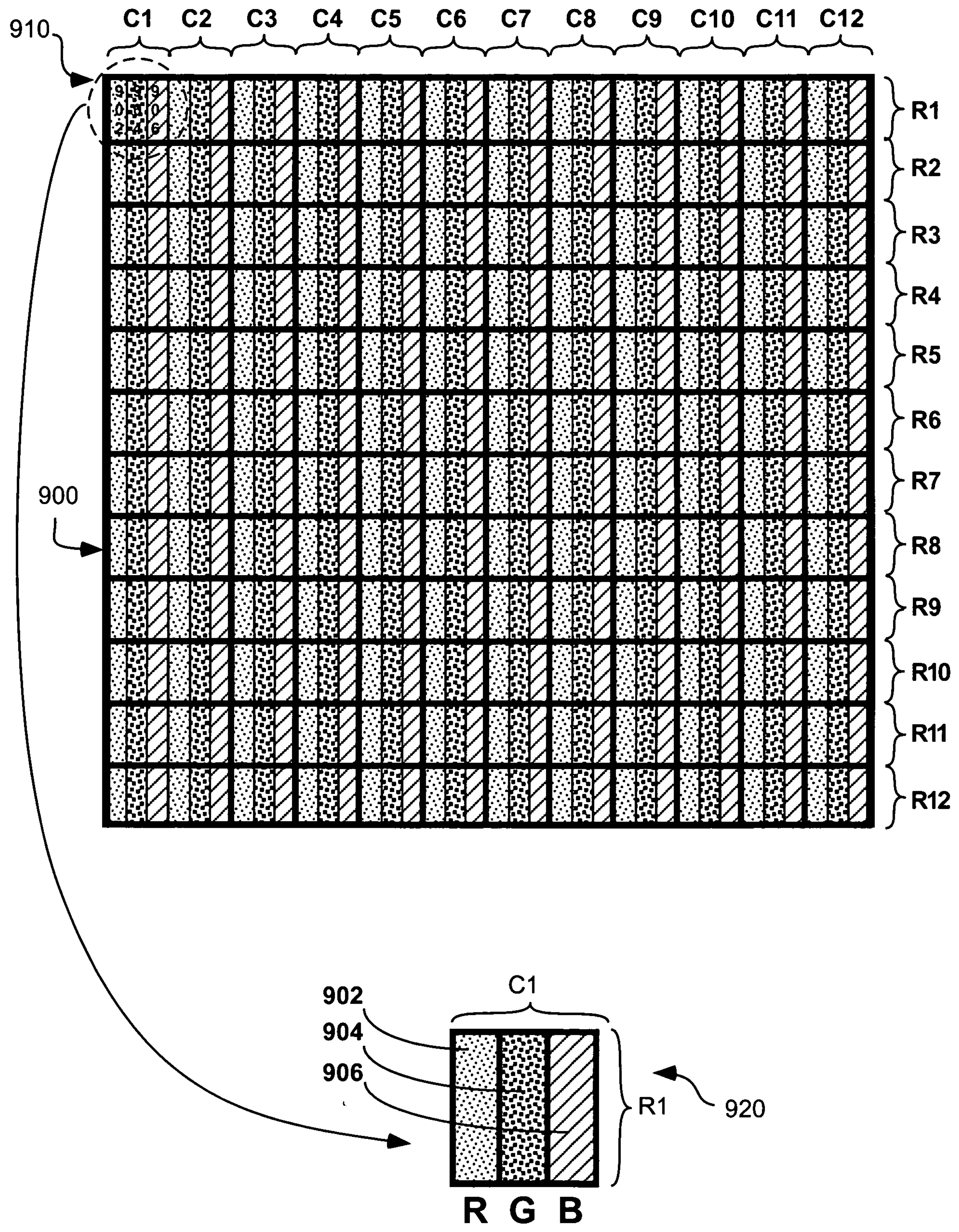
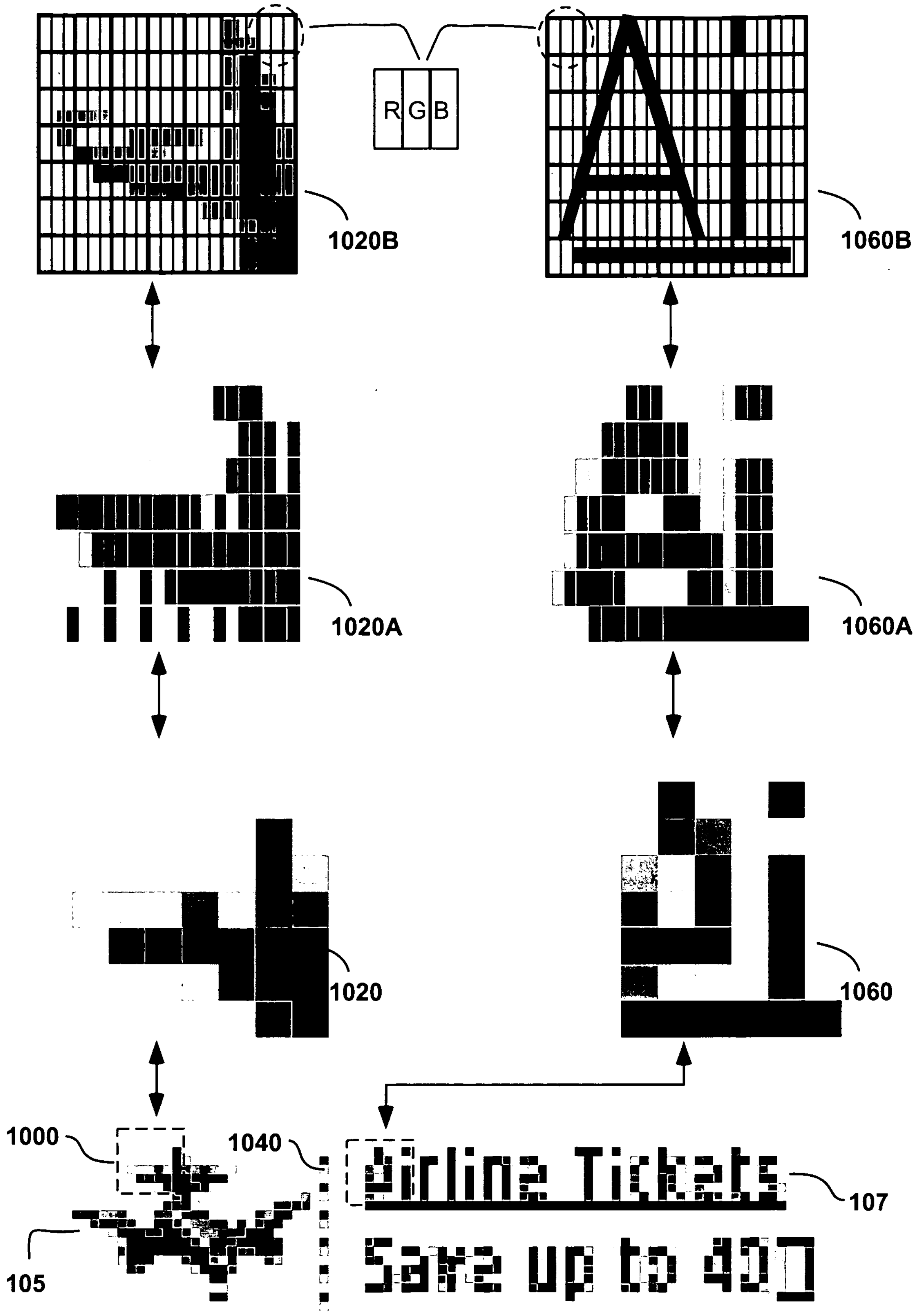

910
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
902
904
906
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
900
C1
902
904
906
R1
920
R
G
B

FIG. 9



RGB
1020B
1060B
1020A
1060A
1020
1060
1000
1040
Airline Tickets
107
Save up to 40%
105

FIG. 10

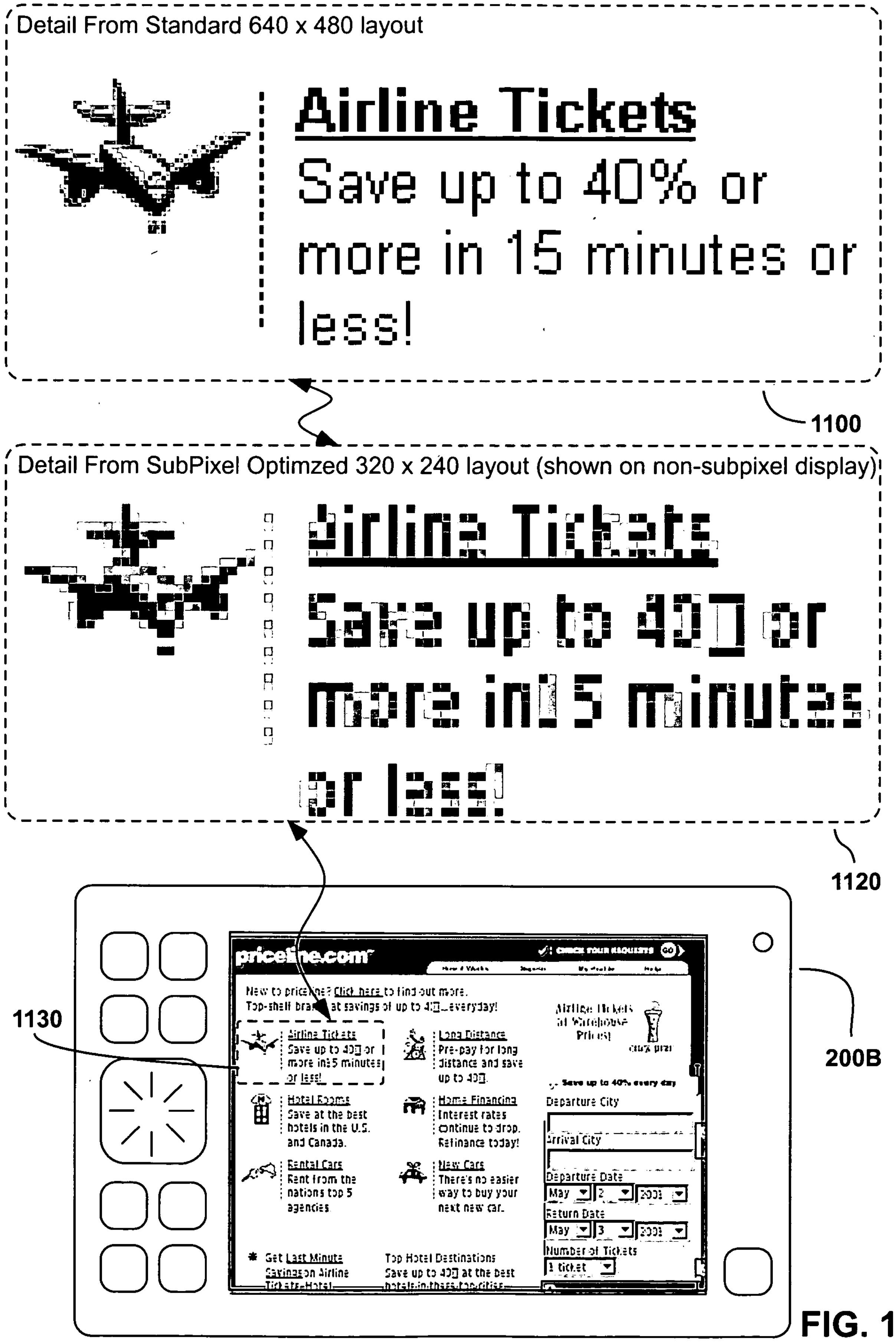

Detail From Standard 640 x 480 layout
Airline Tickets
Save up to 40% or more in 15 minutes or less!
1100
Detail From SubPixel Optimzed 320 x 240 layout (shown on non-subpixel display)
1120
1130
200B
priceline.com
New to priceline? Click here to find out more.
Top-shelf brands at savings of up to 40% everyday!
Airline Tickets
Save up to 40% or more in 15 minutes or less!
Long Distance
Pre-pay for long distance and save up to 40%
Hotel Rooms
Save at the best hotels in the U.S. and Canada.
Home Financing
Interest rates continue to drop. Refinance today!
Rental Cars
Rent from the nations top 5 agencies
New Cars
There's no easier way to buy your next new car.
Departure City
Arrival City
Departure Date
Return Date
Number of Tickets
1 ticket
Get Last Minute Savings on Airline Tickets
Top Hotel Destinations
Save up to 40% at the best

FIG. 11

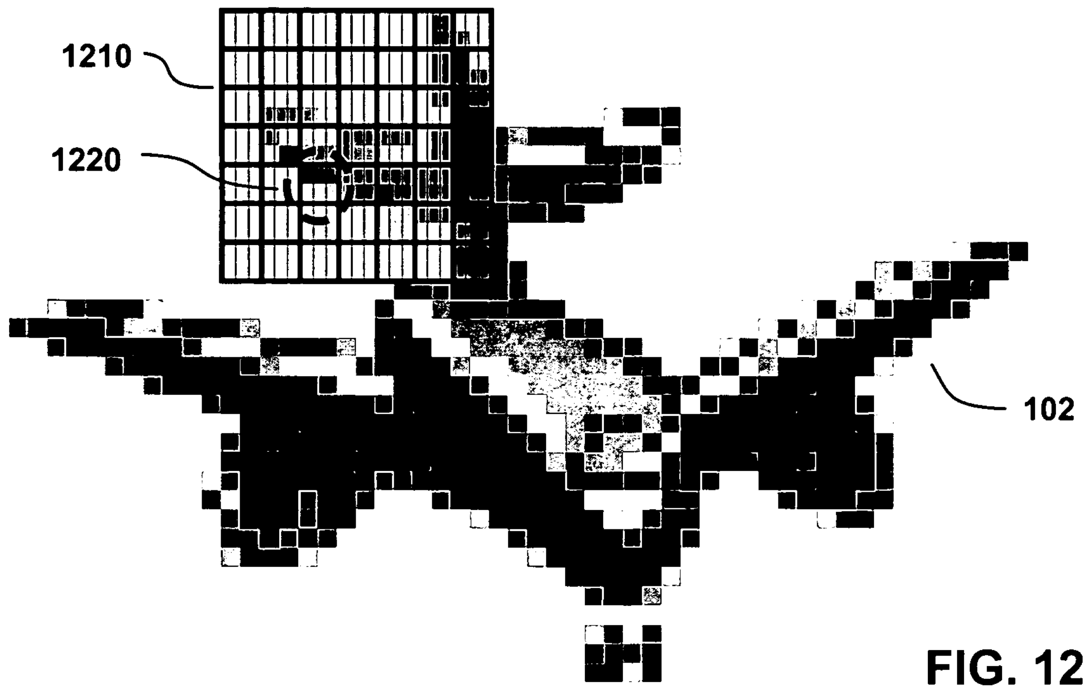


FIG. 12

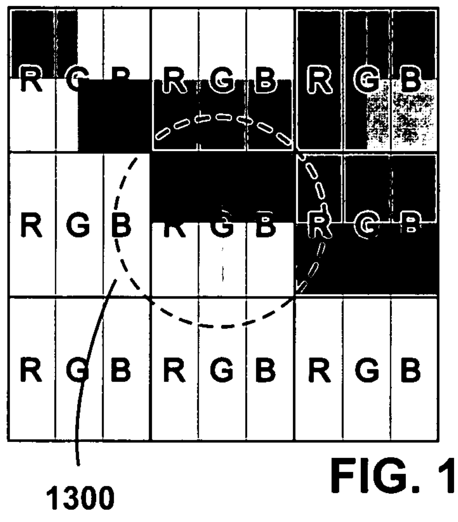


FIG. 13

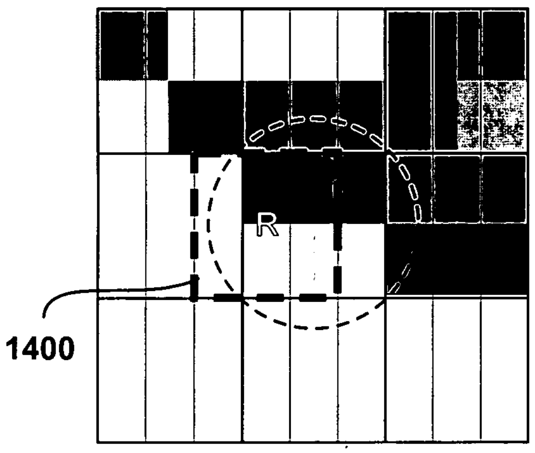


FIG. 14

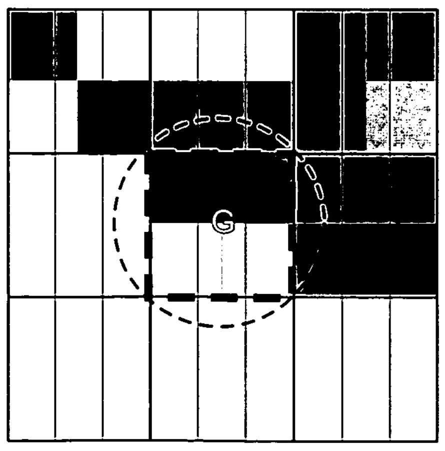


FIG. 15

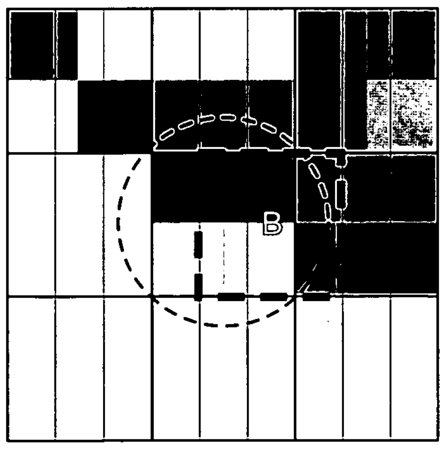


FIG. 16

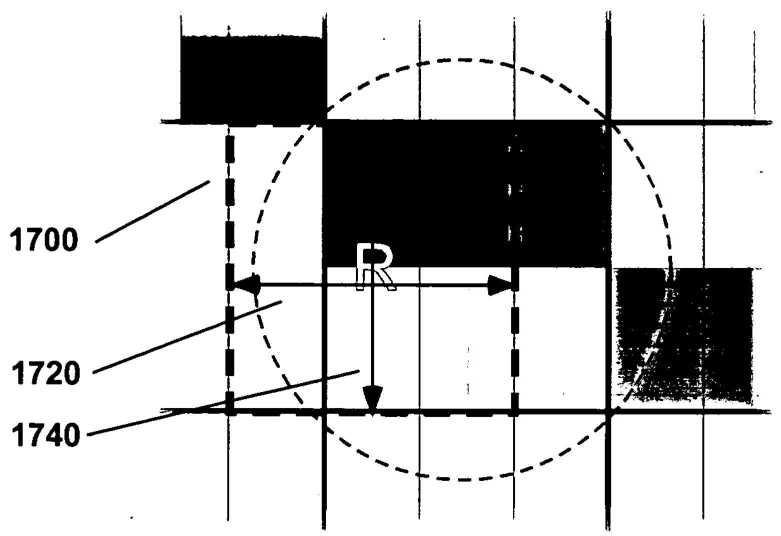


FIG. 17

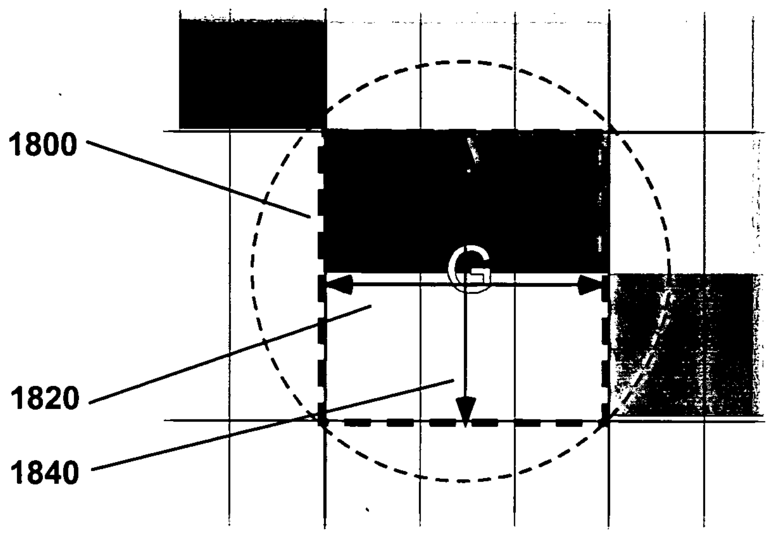


FIG. 18

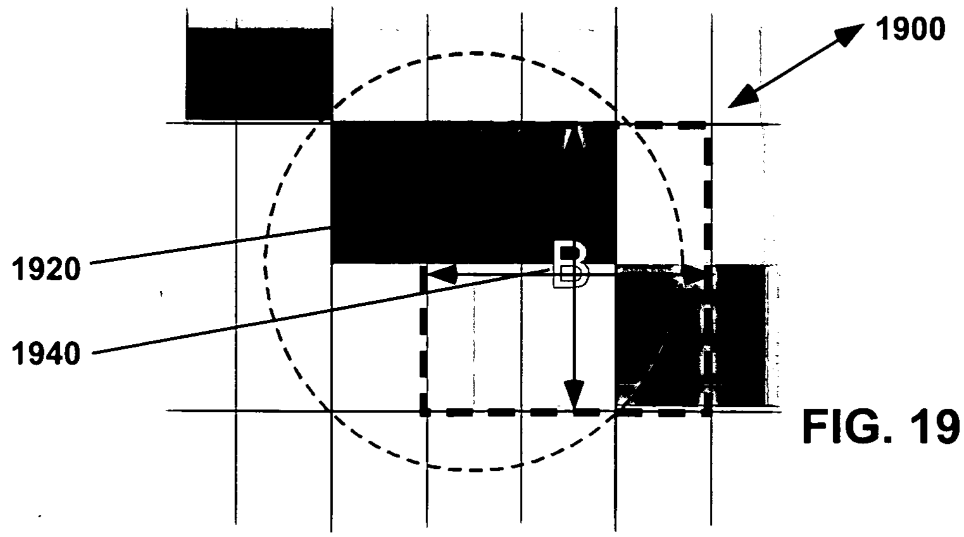


FIG. 19

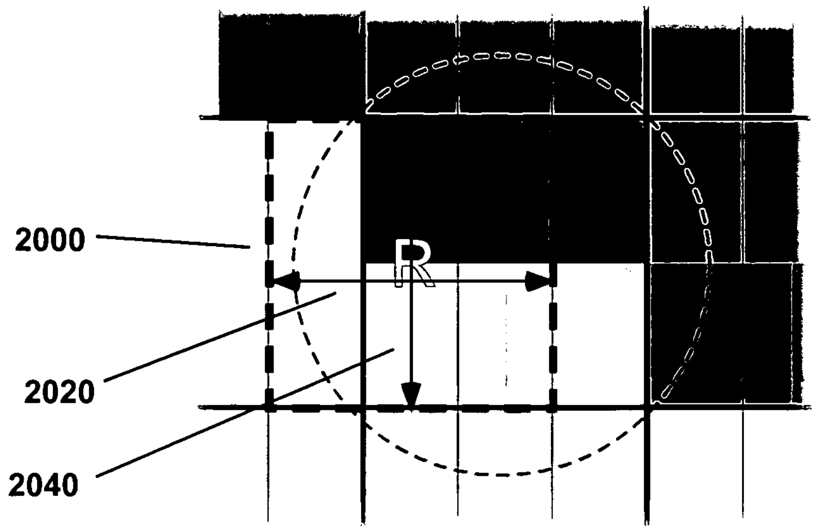


FIG. 20

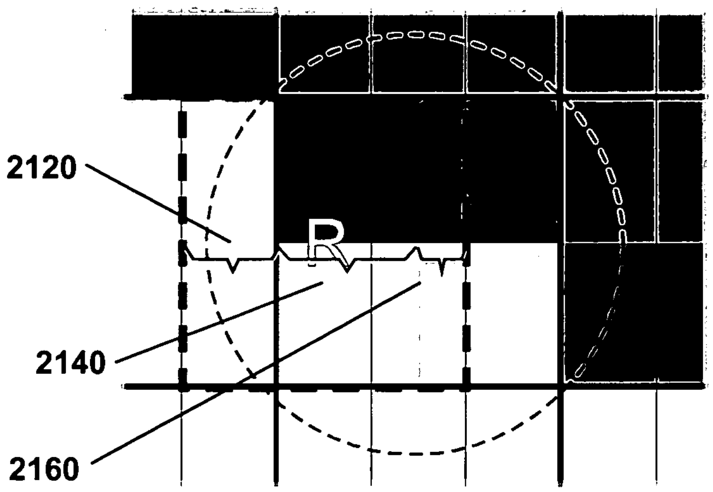


FIG. 21

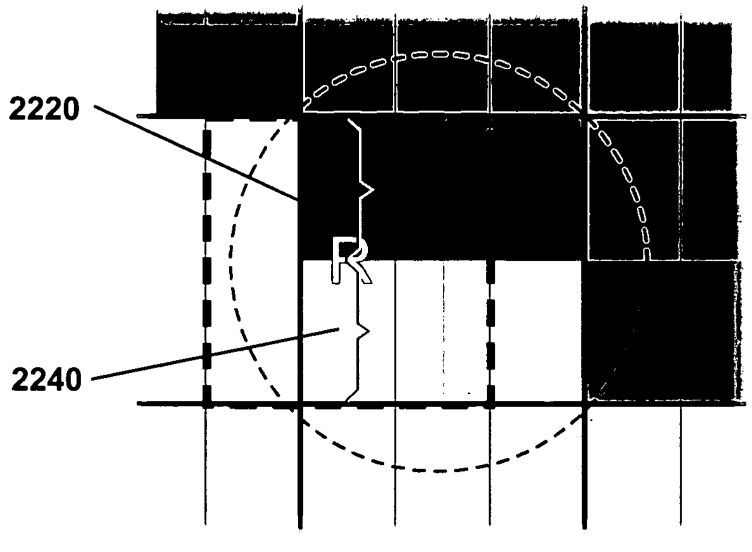


FIG. 22

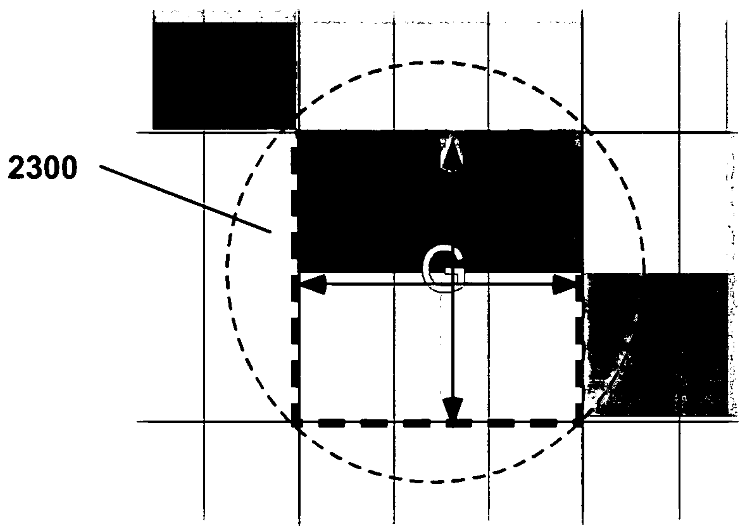


FIG. 23

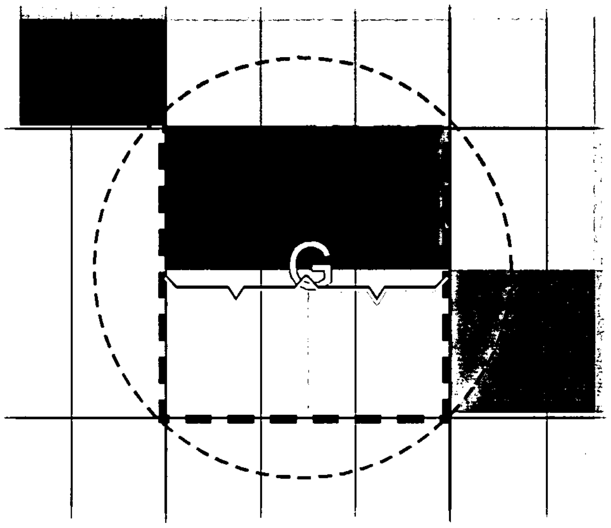


FIG. 24

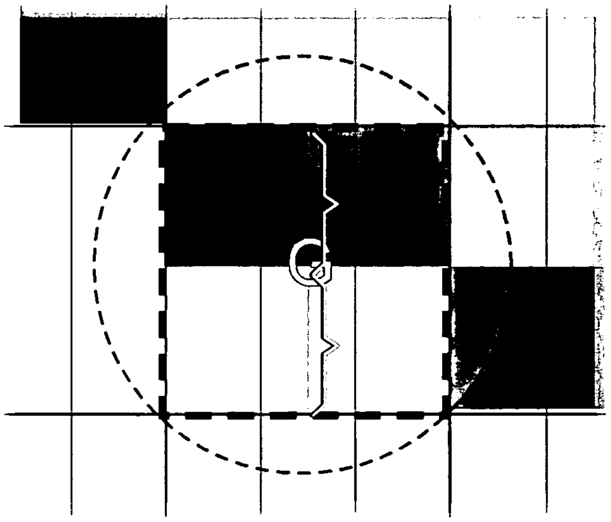


FIG. 25

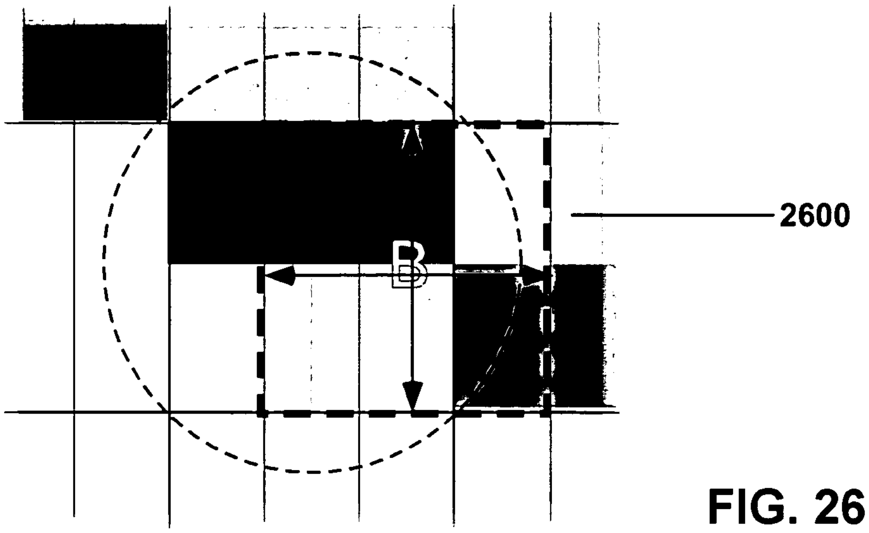


FIG. 26

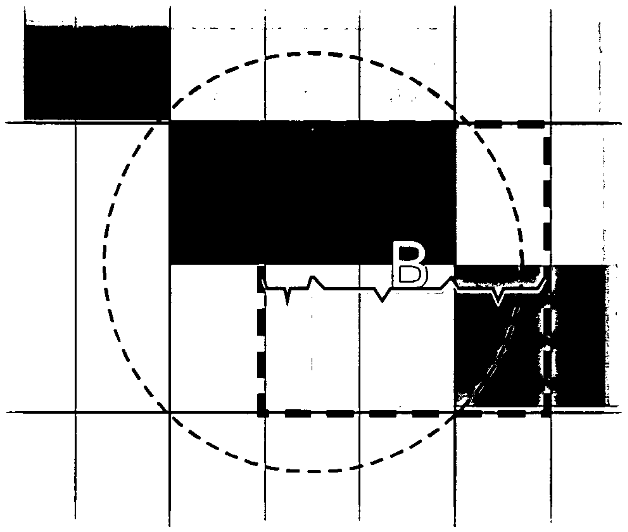


FIG. 27

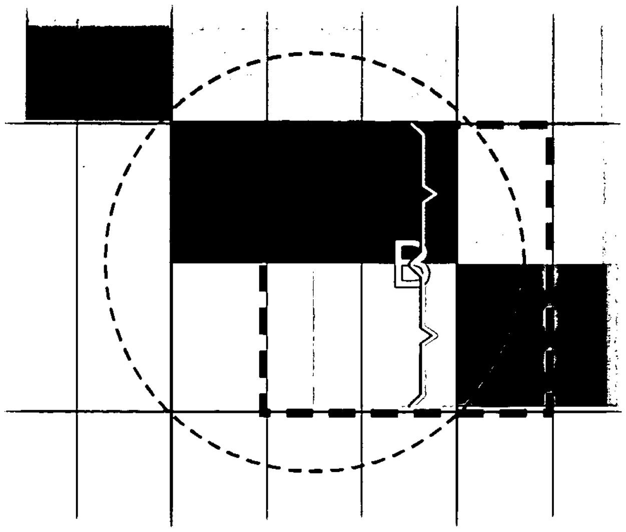


FIG. 28

```
-subpixel optimization routine (using line coverage)~2900
    -for each row in output image~2901
        -for each pixel in row~2902
            -for each subpixel in pixel~2904
                -for each of its scan lines~2906
                    -calculate each intersection between that scan line
                    and a pixel boundary~2908
                    -for each portion of a scan line which occurs
                    between two scan line ends, a scan line end and a
                    pixel boundary, or two pixel boundaries~2910
                        -add to a coverage value associated with the
                        subpixel the multiple of the percent of that
                        scan line covered by the portion times the
                        component color value of the pixel covering
                        that portion corresponding to the color of the
                        current subpixel, all divided by the number of
                        the subpixel's scan lines~2912
            -Set the pixel's color value equal to a color having an compound
            RGB value with red, green, and blue values equal to the subpixel
            luminosity value of the pixel's red, green, and blue subpixels,
            respectively.~2914
```

FIG. 29

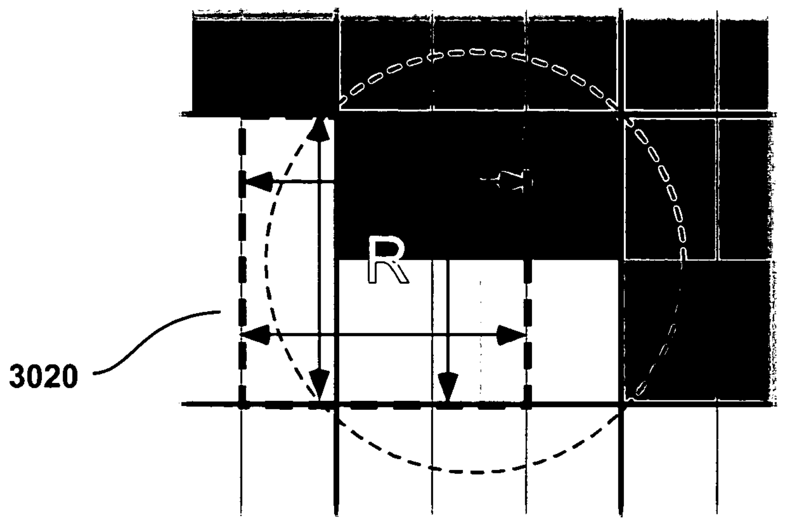


FIG. 30

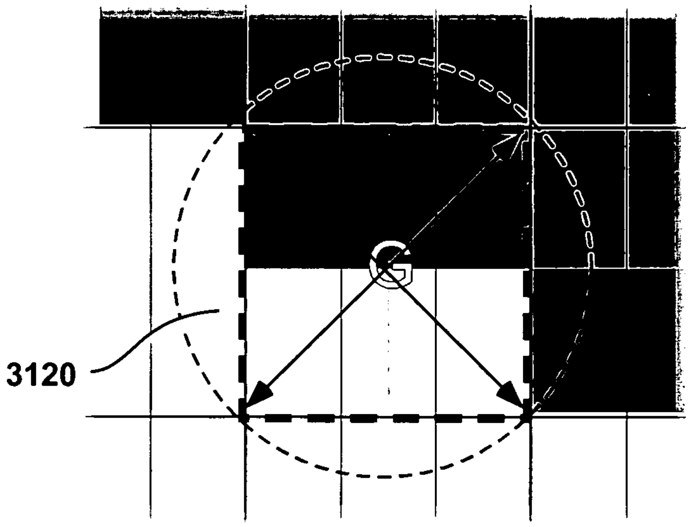


FIG. 31

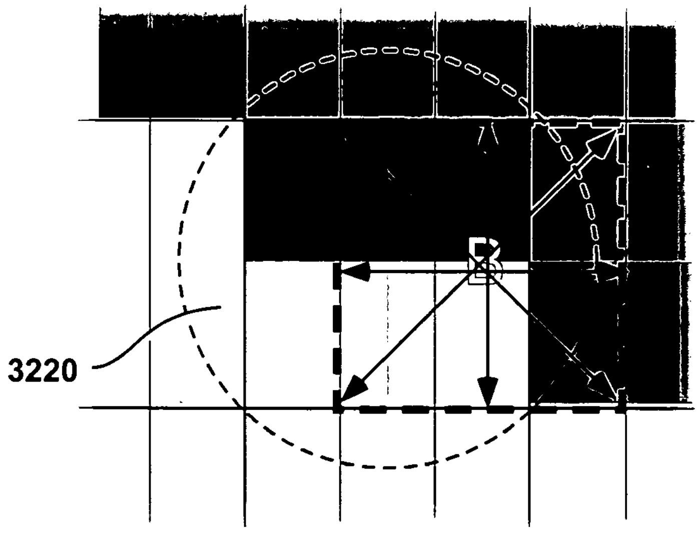


FIG. 32

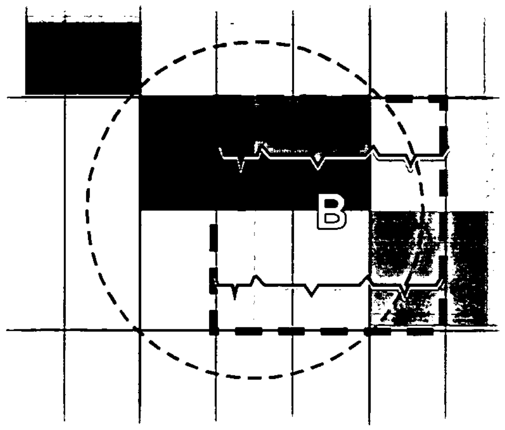


FIG. 33

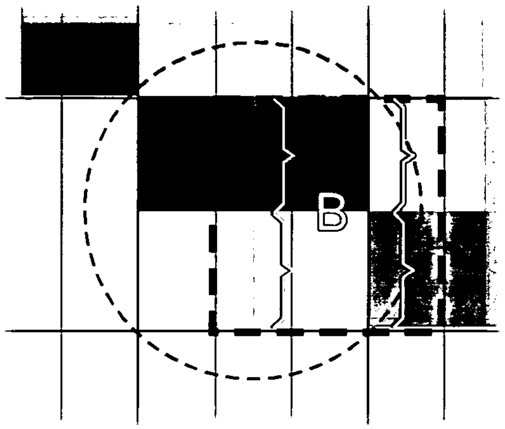


FIG. 34

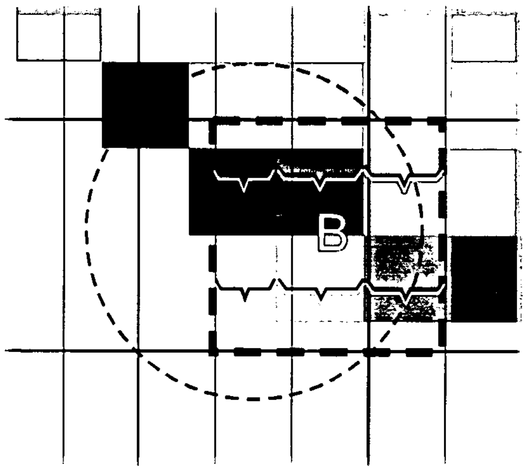


FIG. 35

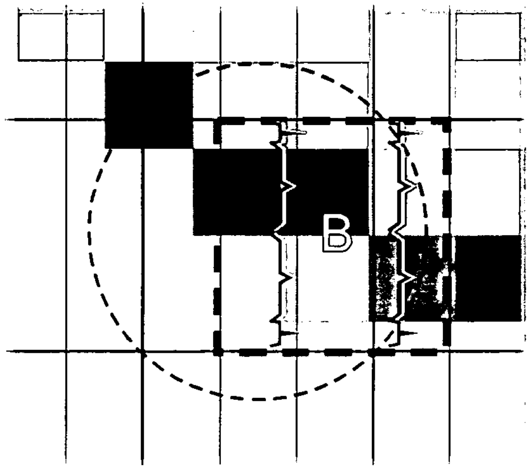


FIG. 36

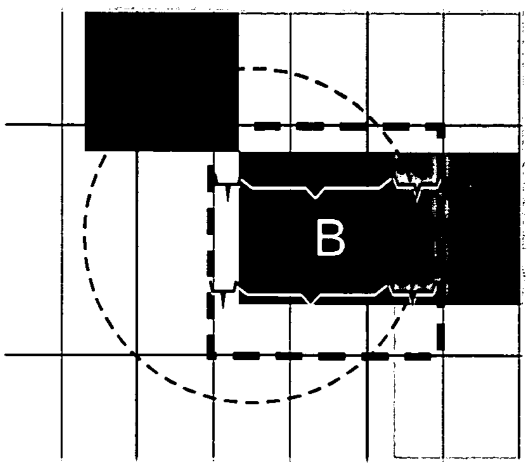


FIG. 37

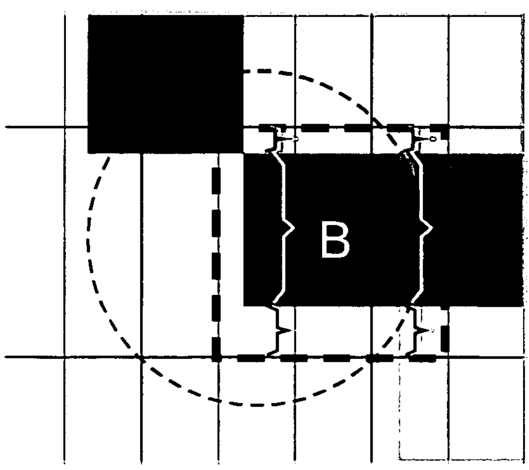


FIG. 38

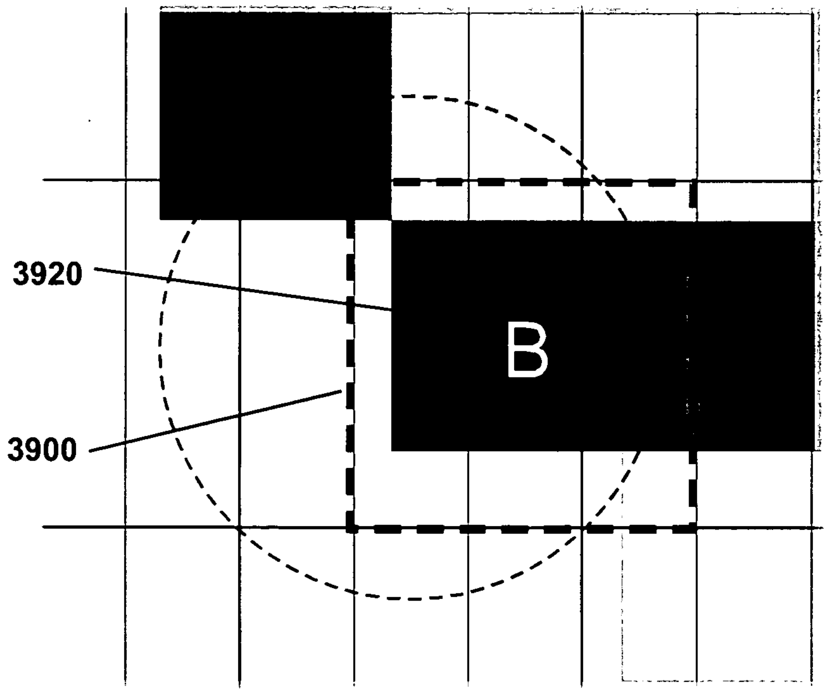


FIG. 39

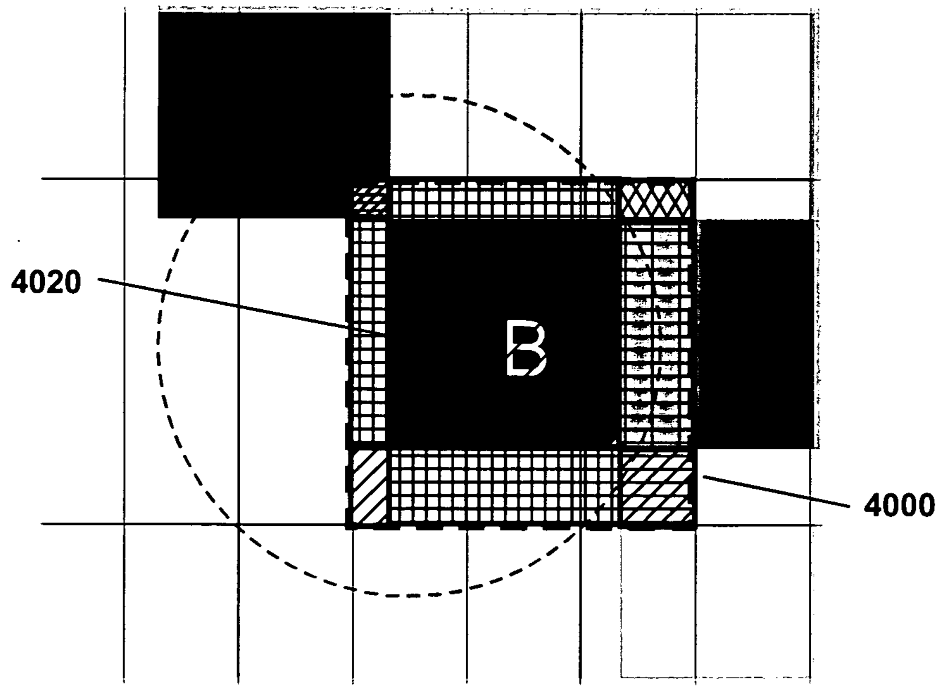


FIG. 40

```
-subpixel optimization routine (using area coverage)~4100
    -for each pixel row in output image~4102
        -for each pixel in row~4104
            -for each subpixel in a pixel~4106
                -determine which pixels of source image are in a source
                image window associated with the subpixel~4108
                -for each such included source image pixel~4110
                    -calculate the percent of the subpixel's source image
                    window's area covered by the pixel's area~4112
                    -add to a luminosity value being calculated for the
                    subpixel the multiple of the percentage of the
                    subpixel's source image window area covered by
                    the pixel times the pixel's color component value
                    corresponding to the color of the current subpixel
                    ~4114
            -Set the pixel's color value equal to a color having an compound
            RGB value with red, green, and blue values equal to the subpixel
            luminosity value calculated for the pixel's red, green, and blue
            subpixels, respectively.~4116
```

FIG. 41

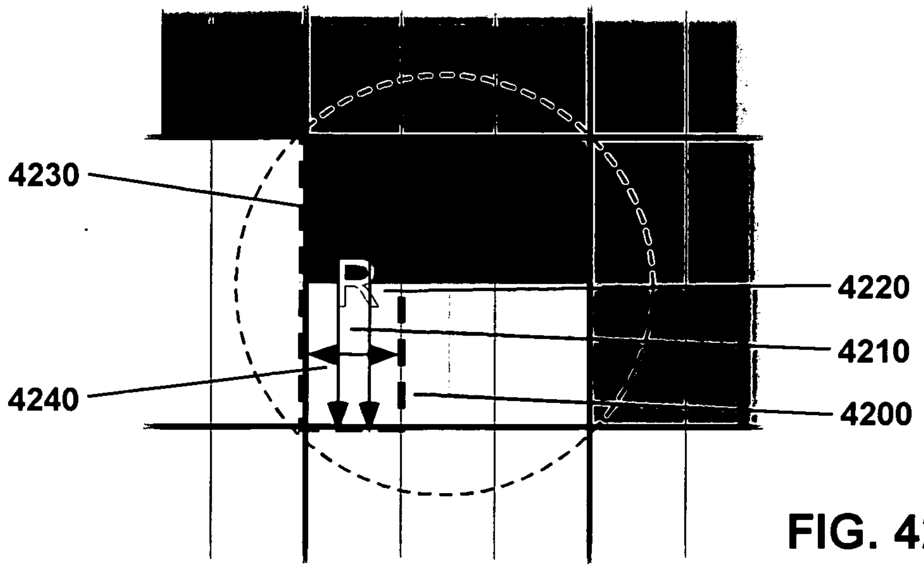


FIG. 42

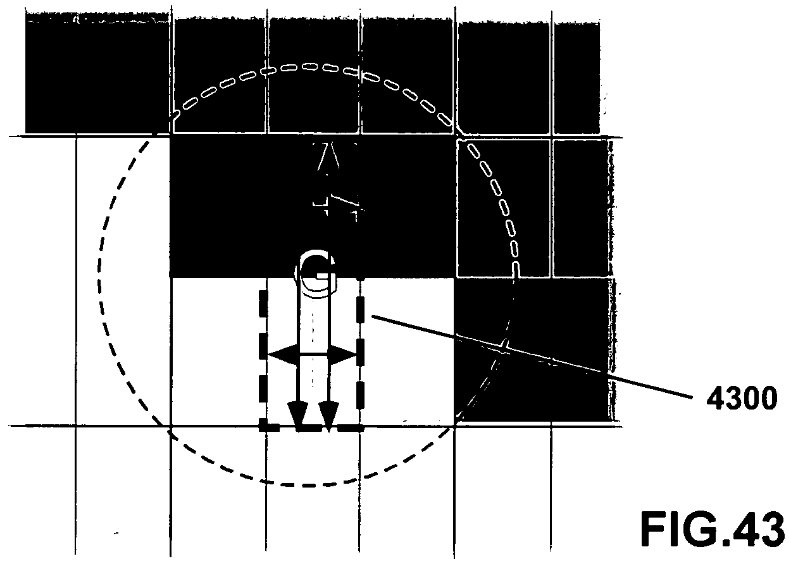


FIG.43

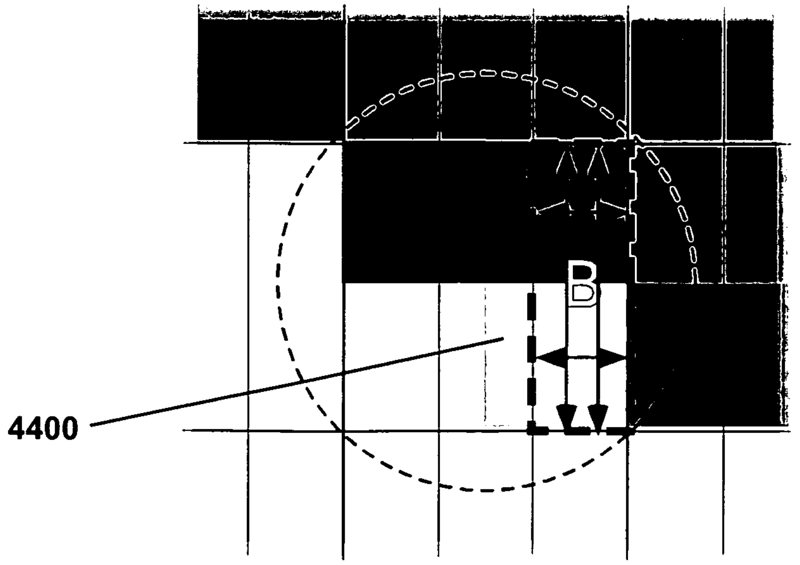


FIG. 44

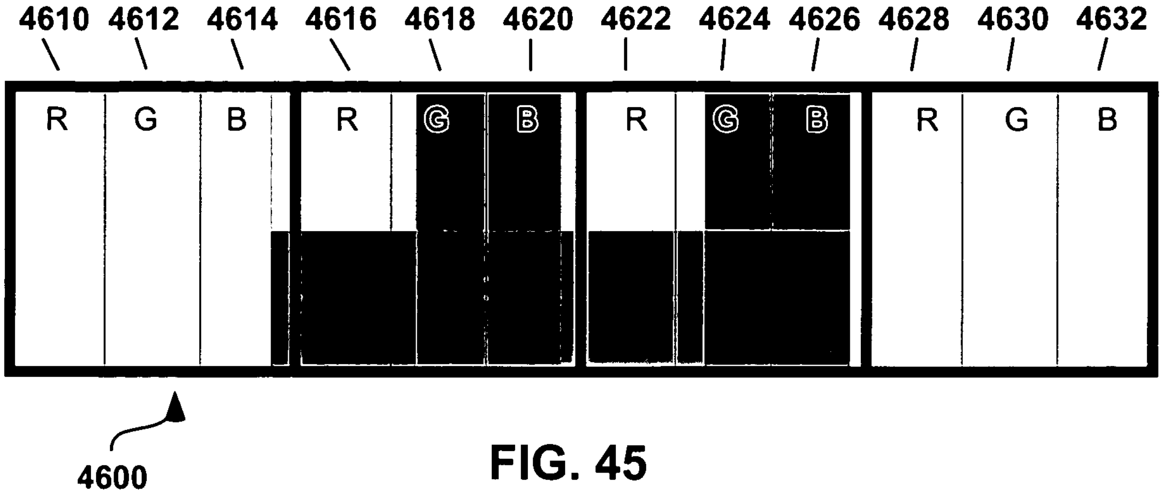

4610
4612
4614
4616
4618
4620
4622
4624
4626
4628
4630
4632
R
G
B
R
G
B
R
G
B
R
G
B
4600

FIG. 45

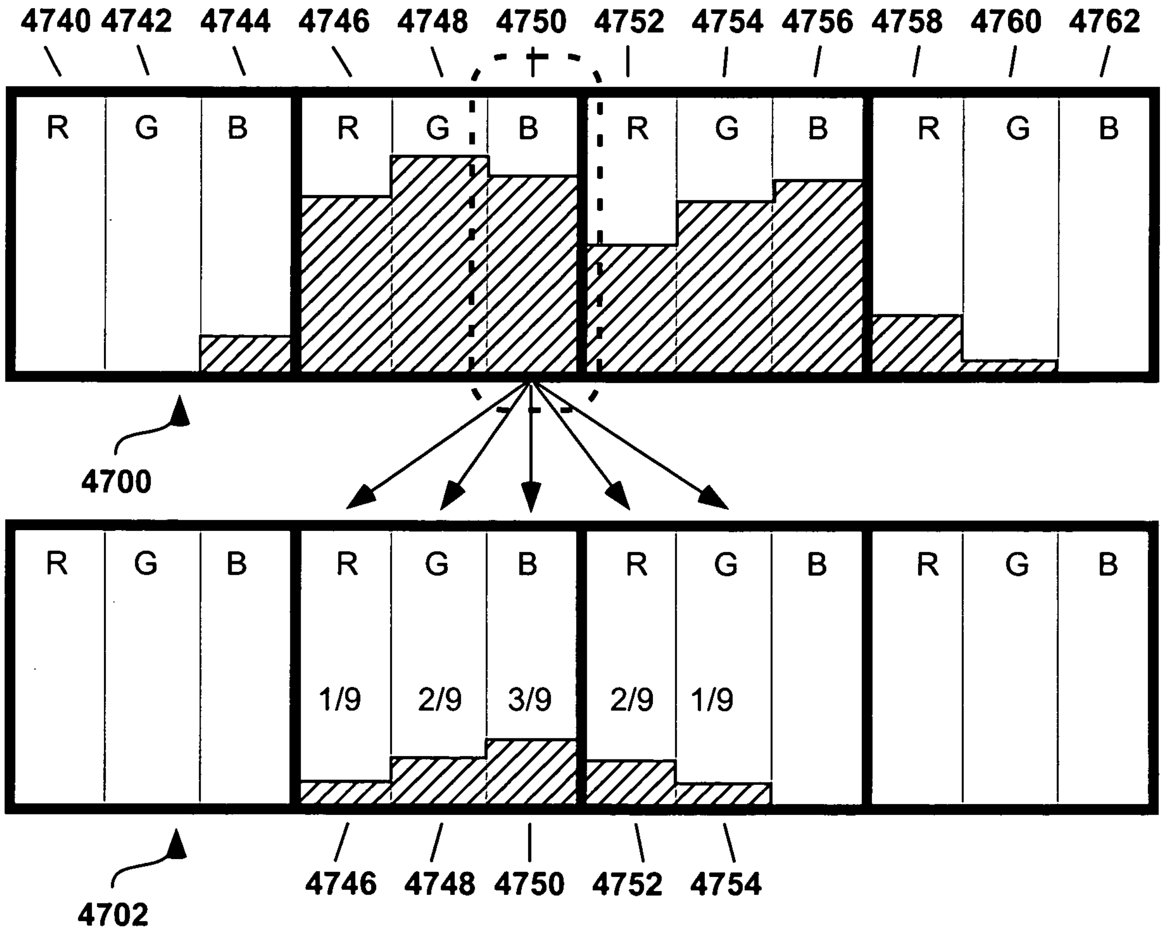

4740
4742
4744
4746
4748
4750
4752
4754
4756
4758
4760
4762
R
G
B
R
G
B
R
G
B
R
G
B
4700
R
G
B
R
G
B
R
G
B
R
G
B
1/9
2/9
3/9
2/9
1/9
4746
4748
4750
4752
4754
4702

FIG. 46

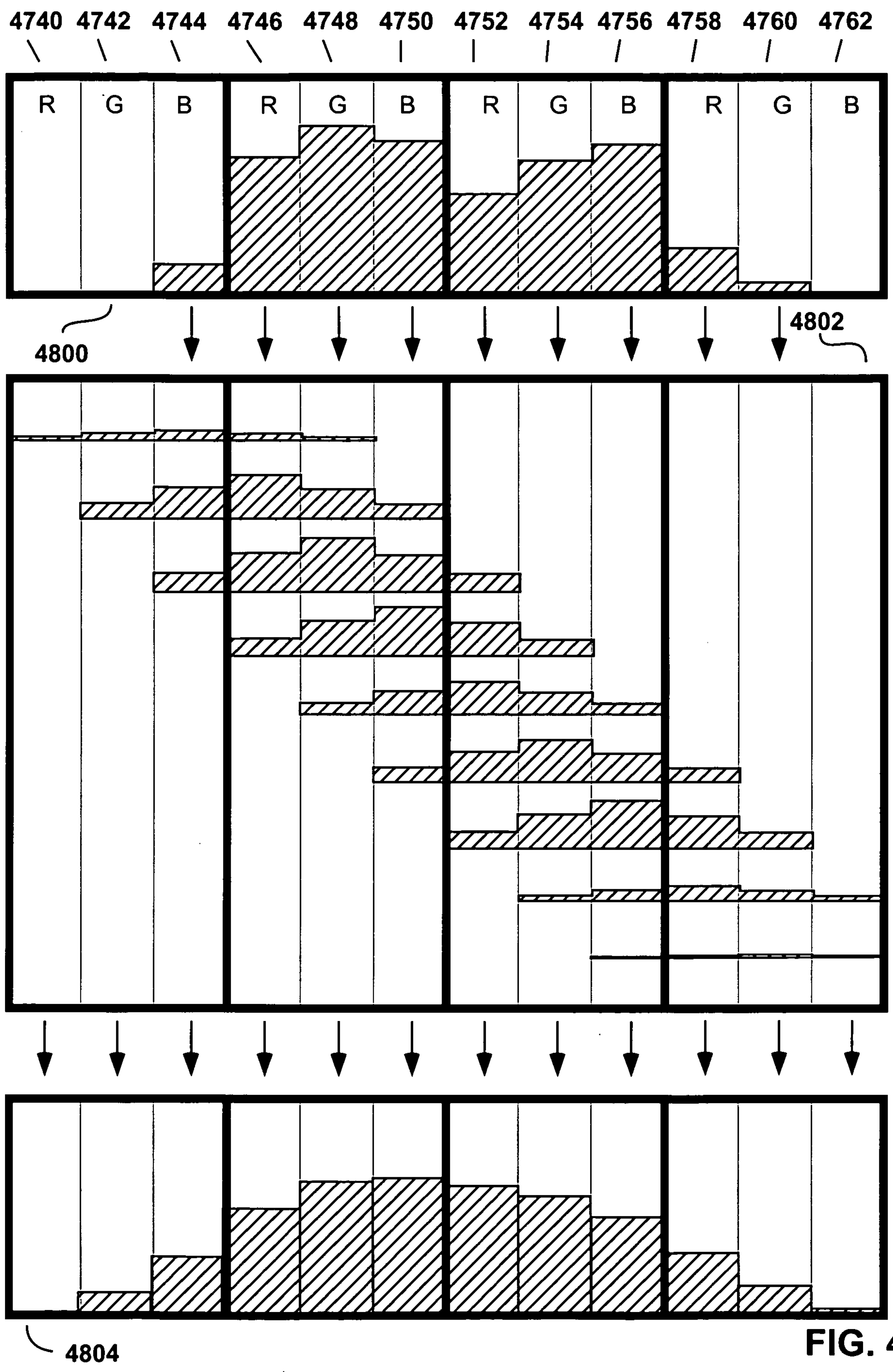

4740
4742
4744
4746
4748
4750
4752
4754
4756
4758
4760
4762
R
G
B
R
G
B
R
G
B
R
G
B
4800
4802
4804

FIG. 47

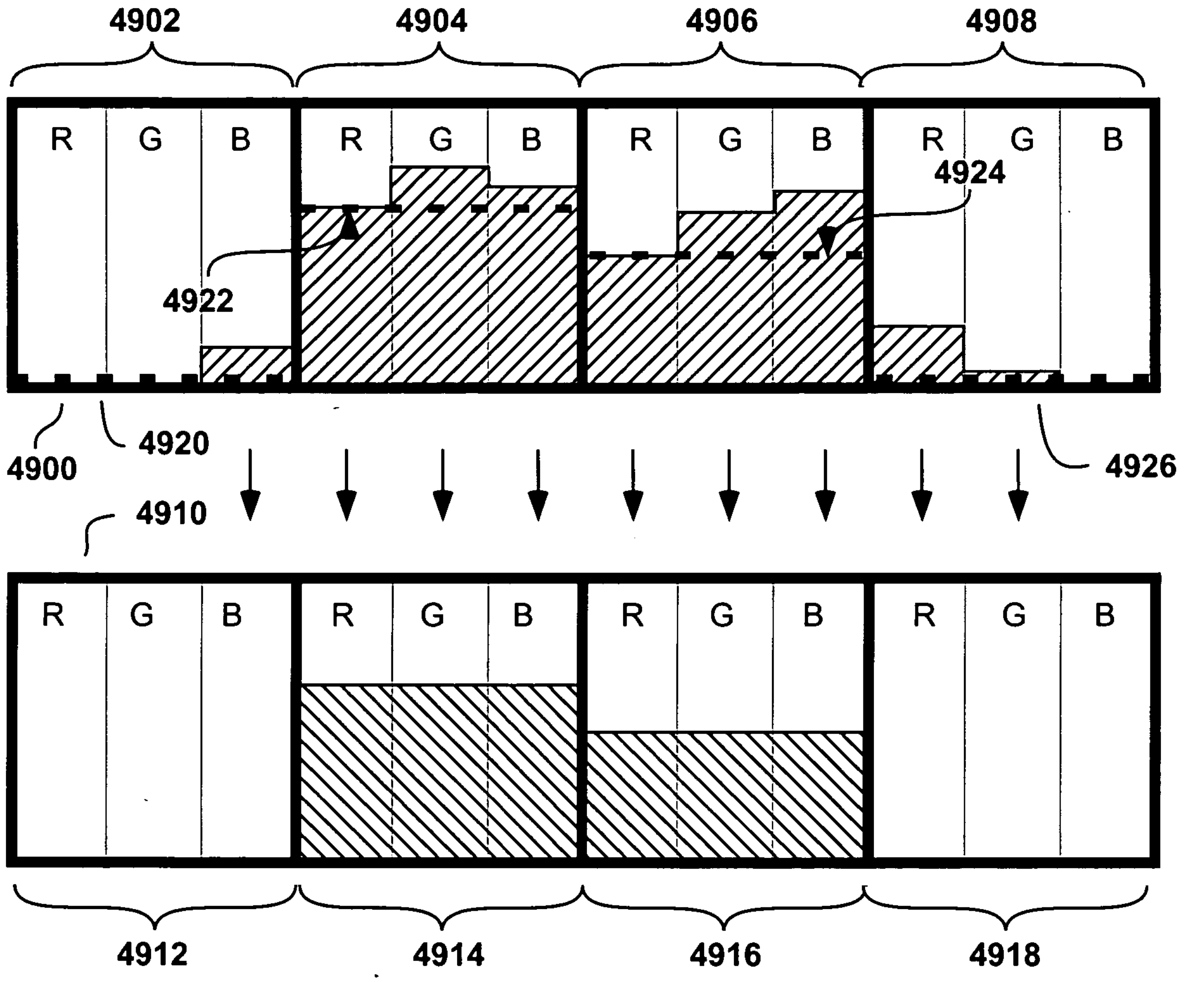
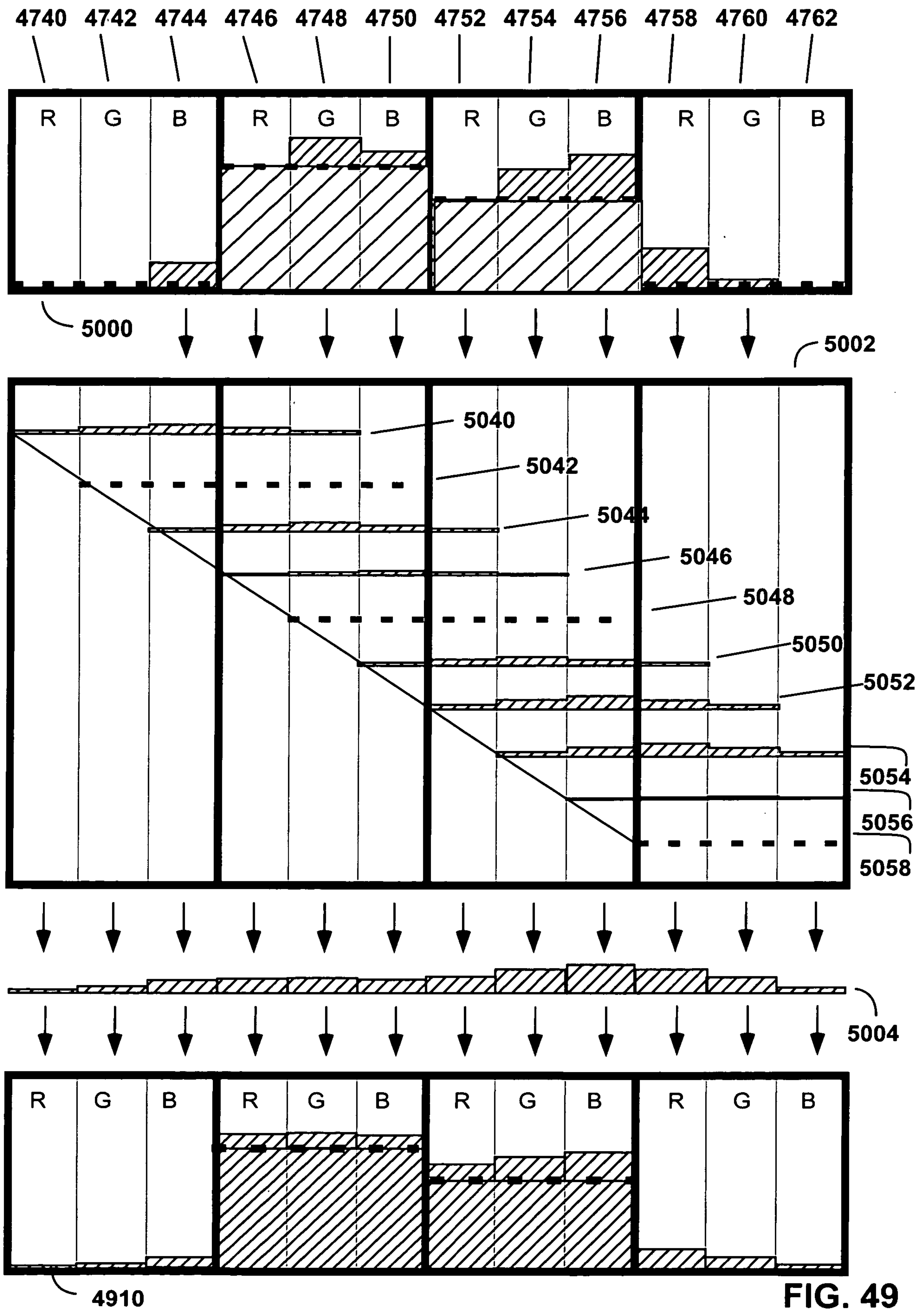

4902
4904
4906
4908
R
G
B
R
G
B
R
G
B
R
G
B
4924
4922
4900
4920
4926
4910
R
G
B
R
G
B
R
G
B
R
G
B
4912
4914
4916
4918

FIG. 48



4740
4742
4744
4746
4748
4750
4752
4754
4756
4758
4760
4762
R
G
B
R
G
B
R
G
B
R
G
B
5000
5002
5040
5042
5044
5046
5048
5050
5052
5054
5056
5058
5004
R
G
B
R
G
B
R
G
B
R
G
B
4910

FIG. 49

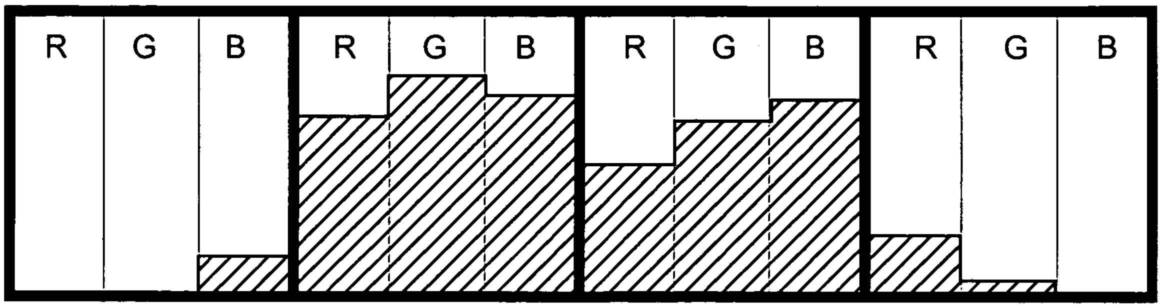


FIG. 50

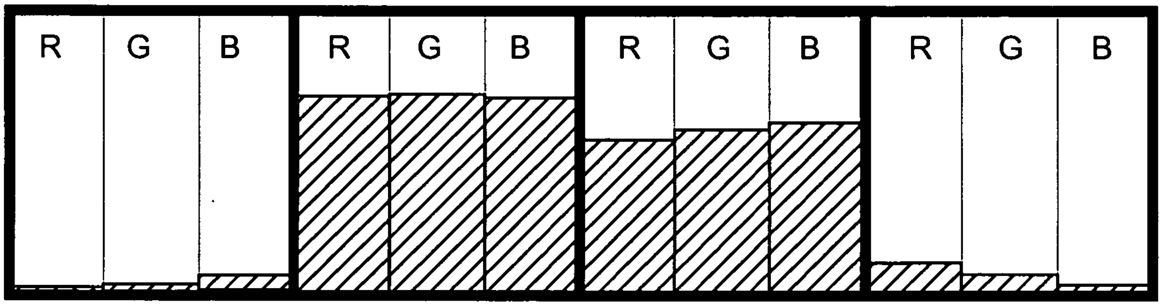


FIG. 51

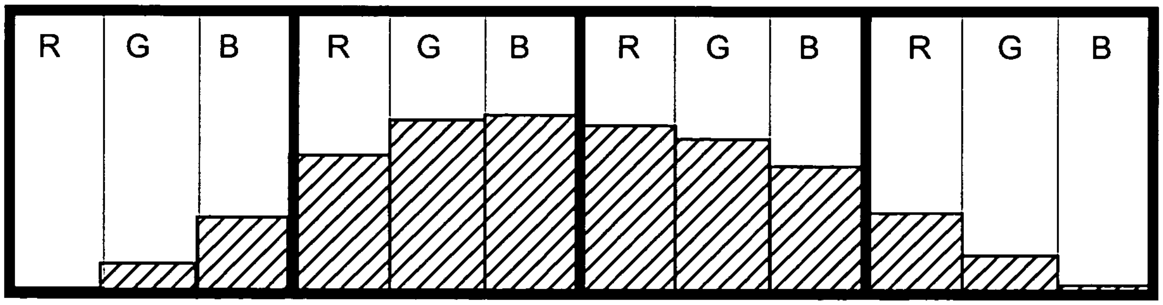


FIG. 52

```
-subpixel optimization for bicolor bitmap ~5300
-for each pixel row in image~5301
        -for each pixel in row~5302
            -for each subpixel in the pixel~5304
                -determine which pixels of source image are in a window
                portion of source image corresponding to subpixel's area in
                scaled image~5306
                -for each source image pixel all or partially in the subpixel's
                source image window~5308
                    -calculate the percent of the window's area covered
                    by the pixel's area~5310
                    -add to a luminosity/coverage value calculated for
                    the subpixel the multiple of the percentage of the
                    window area covered by the pixel times the pixel
                    average foreground color intensity~5312
            -find the minimum subpixel luminosity/coverage value so
            calculated for the pixel~5314
            -for each subpixel in pixel~5316
                -set a luminosity/alpha value being calculated for the sub
                and the pixel to the pixel's minimum subpixel
                luminosity/coverage value~5318
                -distribute that portion of the subpixel's luminosity/coverage
                value that exceeds the pixel's mininum subpixel
                luminosity/coverage value to the luminosity/alpha values
                being calculated for the subpixel and adjacent subpixels in
                the pixel row using a color balance distribution filter~5320
        -For each pixel in row~5322
            -set the pixel's color value equal to a color having an compound
            RGB value with red, green, and blue component values equal to
            thlse luminosity/alpha values calculated for the pixel's red, green,
            and blue subpixels, respectively.~5324
```

FIG. 53

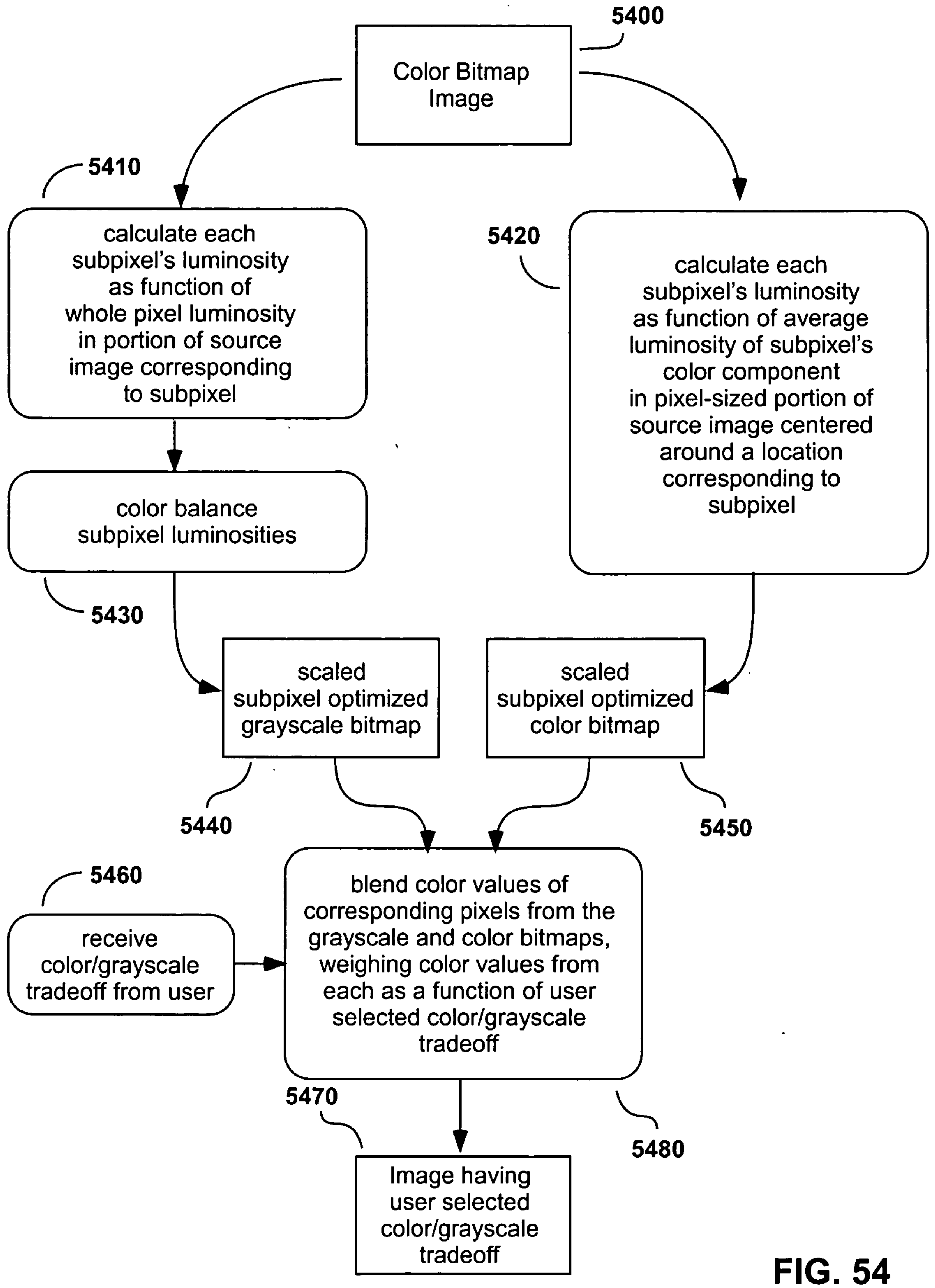

5400
Color Bitmap Image
5410
calculate each subpixel's luminosity as function of whole pixel luminosity in portion of source image corresponding to subpixel
5420
calculate each subpixel's luminosity as function of average luminosity of subpixel's color component in pixel-sized portion of source image centered around a location corresponding to subpixel
color balance subpixel luminosities
5430
scaled subpixel optimized grayscale bitmap
scaled subpixel optimized color bitmap
5440
5450
5460
receive color/grayscale tradeoff from user
blend color values of corresponding pixels from the grayscale and color bitmaps, weighing color values from each as a function of user selected color/grayscale tradeoff
5470
5480
Image having user selected color/grayscale tradeoff

FIG. 54

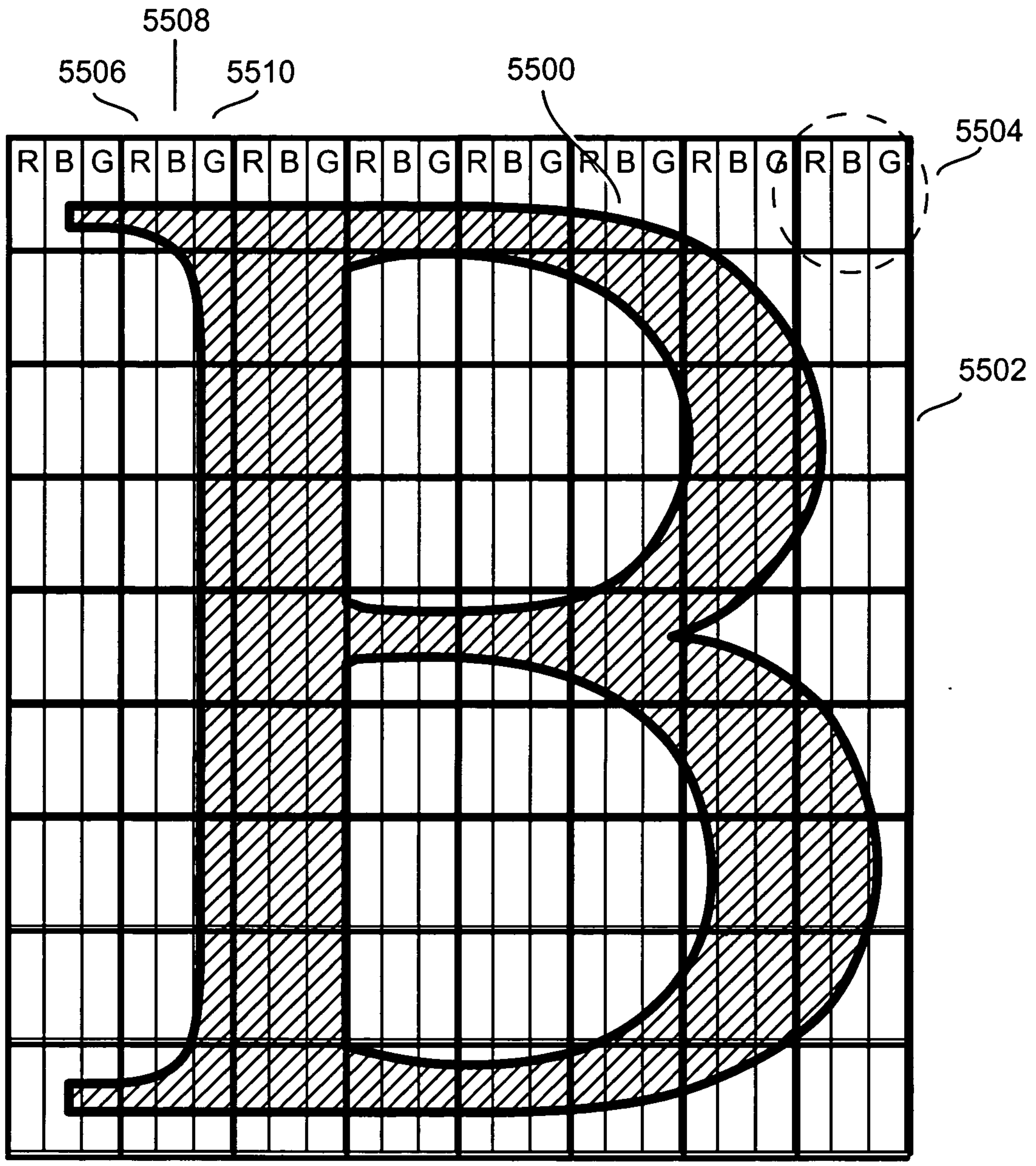


FIG. 55

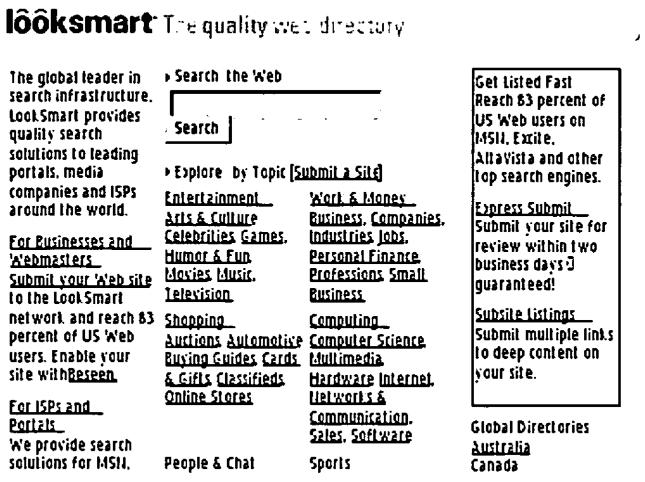


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FIG. 56

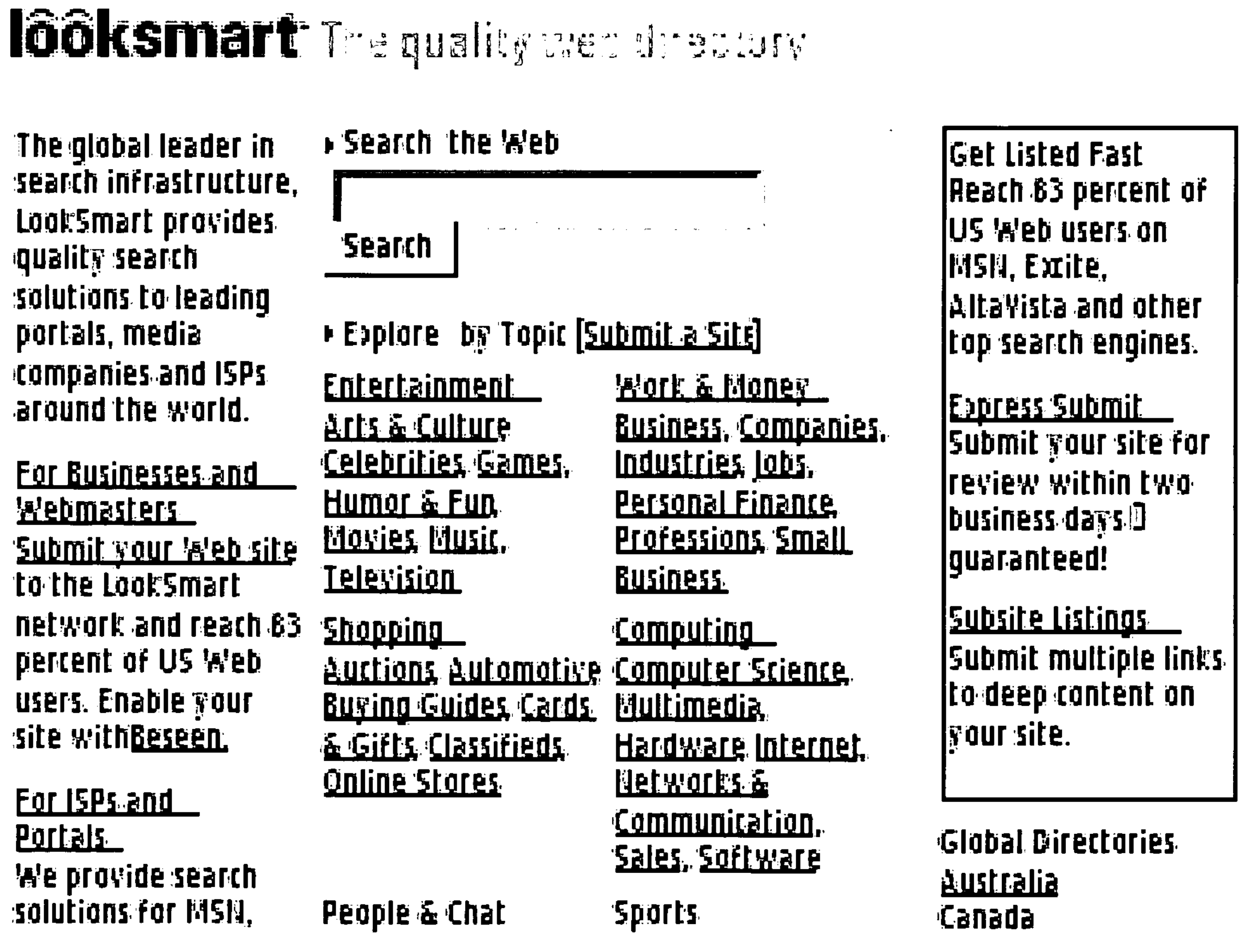

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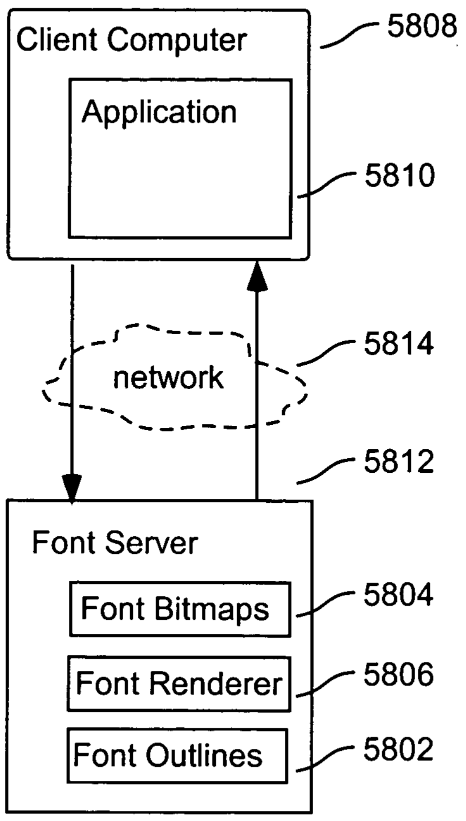
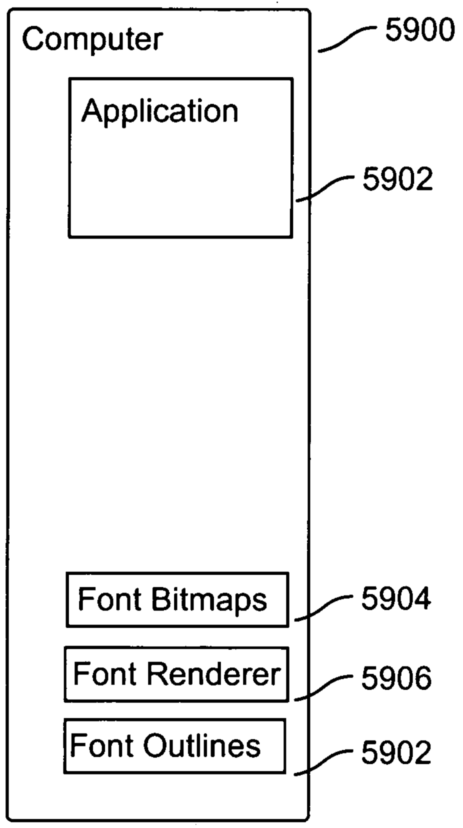
FIG. 57



Client Computer
5808
Application
5810
network
5814
5812
Font Server
Font Bitmaps
5804
Font Renderer
5806
Font Outlines
5802

FIG. 58



Computer
5900
Application
5902
Font Bitmaps
5904
Font Renderer
5906
Font Outlines
5902

FIG. 59

```
-subpixel optimized font bitmaps with non-linear color balance~6000
    -for each pixel row~6002
        -for each subpixel in a row~6004
            -determine a coverage value representing the perecent the
            subpixel which is covered by the font shape~6006
        -for each pixel in row~6008
            -determine the minimum coverage value calculated for each of its
            three subpixels ~6010
            -add minimum to temporary alpha value being calculated for each
            subpixel of the pixel~6012
            -for each of pixel's subpixels~6014
                -determine excess of subpixel's coverage value over the
                pixel's minimum~6016
                -distribute this excess value into sub-pixel alpha values
                based on color balance distribution filter appropriate for
                sub-pixel's color~6018
        -for each pixel in row~6020
            -use the three color alpha value defined for each pixel by the three
            alpha values calculated for its subpixels in a look-up table to map
            that value into one of relatively small palette of colors~6022
```

FIG. 60

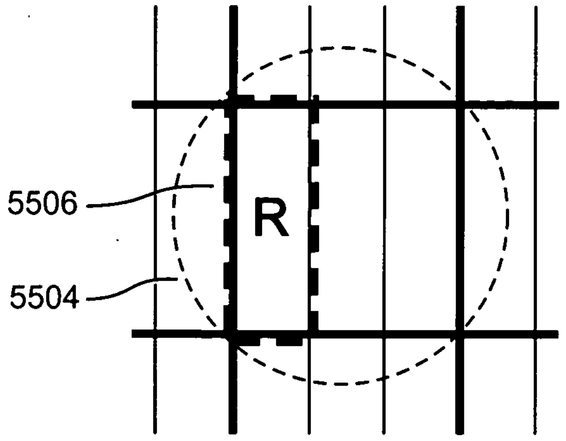


FIG. 61

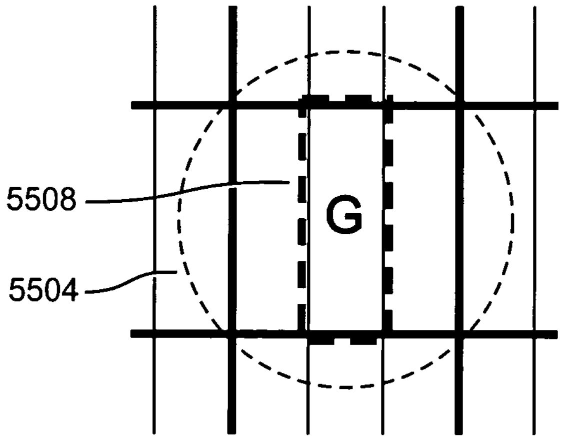


FIG. 62

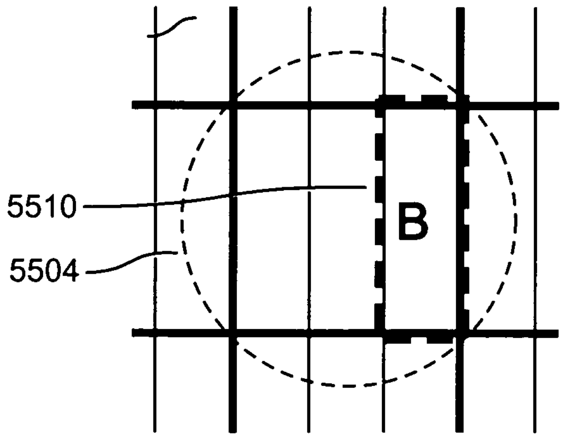
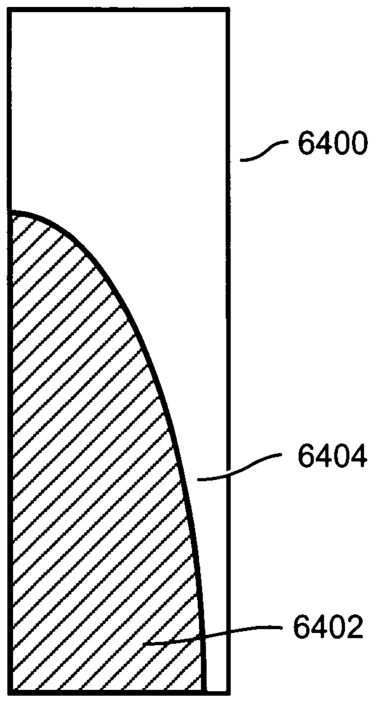
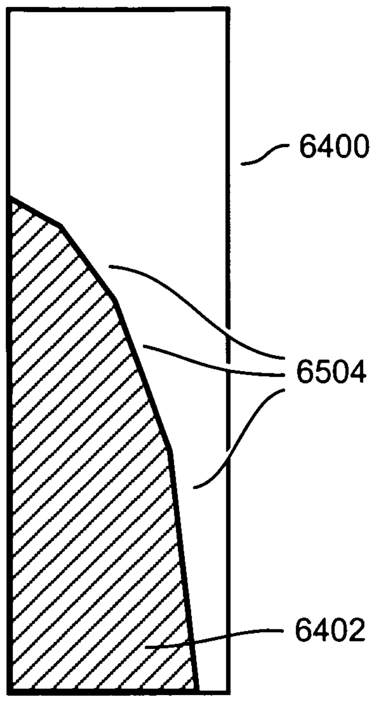


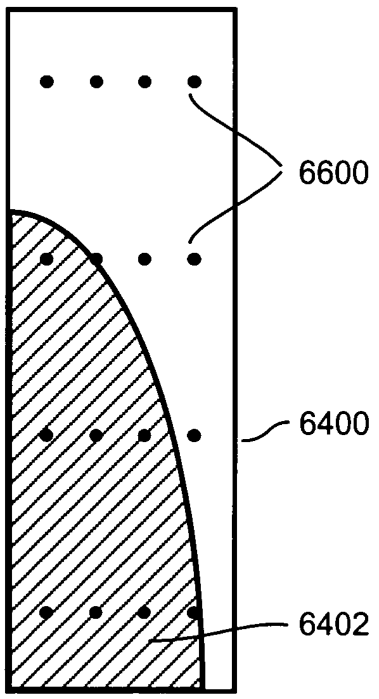
FIG. 63



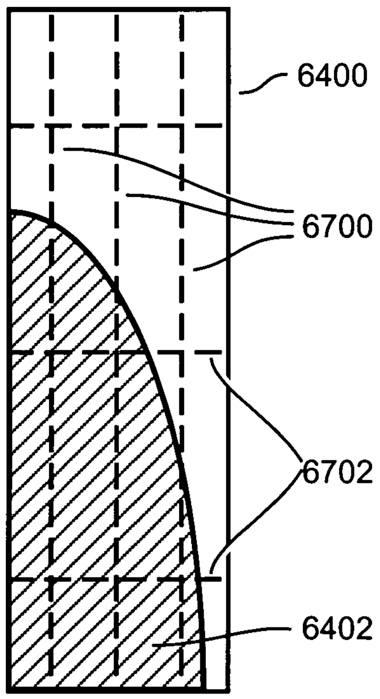
PRIOR ART
FIG. 64



PRIOR ART
FIG. 65



PRIOR ART
FIG. 66



PRIOR ART
FIG. 67

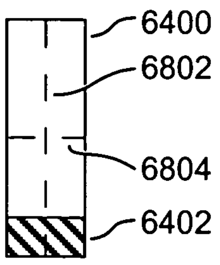


FIG. 68

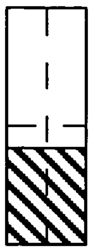


FIG. 69

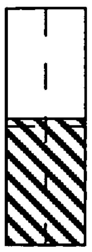


FIG. 70

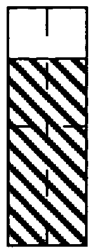


FIG. 71

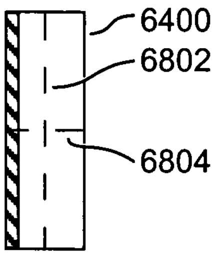


FIG. 72

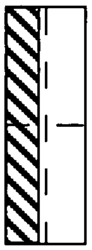


FIG. 73

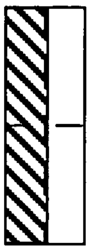


FIG. 74

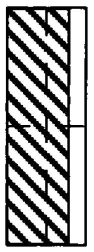


FIG. 75

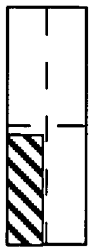


FIG. 76

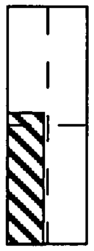


FIG. 77

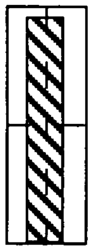


FIG. 78

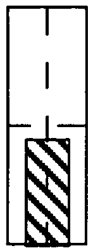


FIG. 79

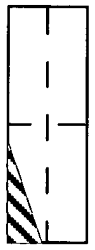


FIG. 80

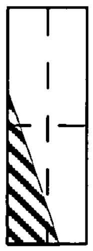


FIG. 81

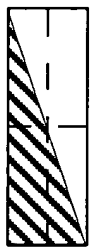


FIG. 82

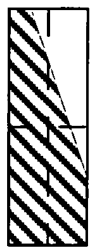


FIG. 83

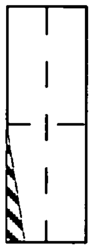


FIG. 84

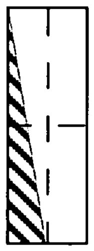


FIG. 85

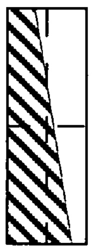


FIG. 86

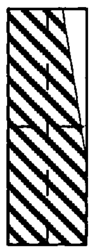


FIG. 87

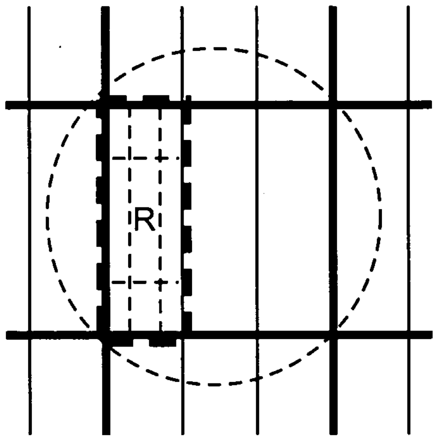


FIG. 88

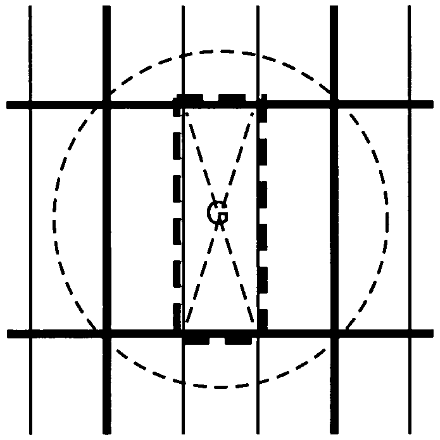


FIG. 89

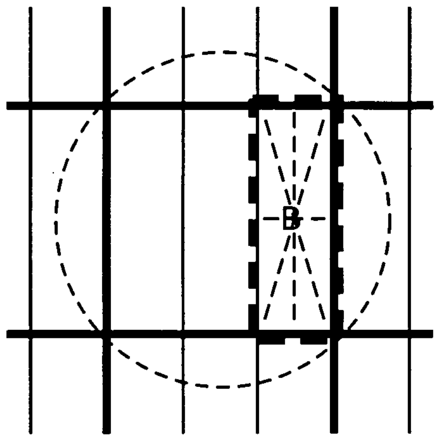


FIG. 90

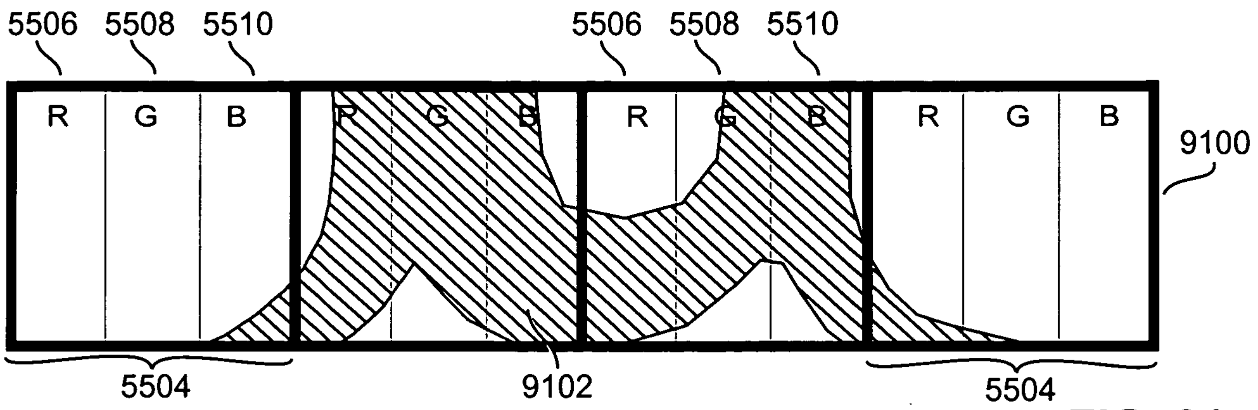


FIG. 91

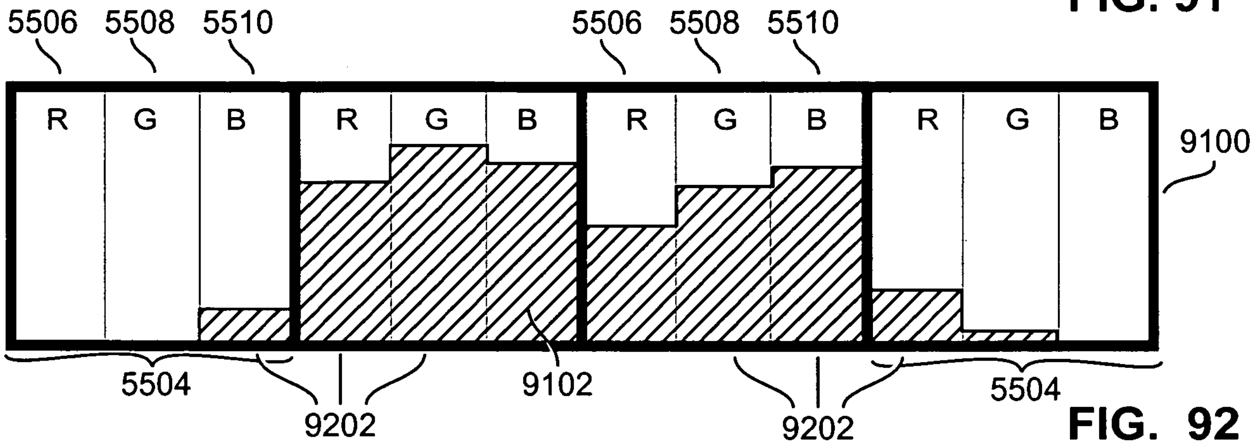


FIG. 92

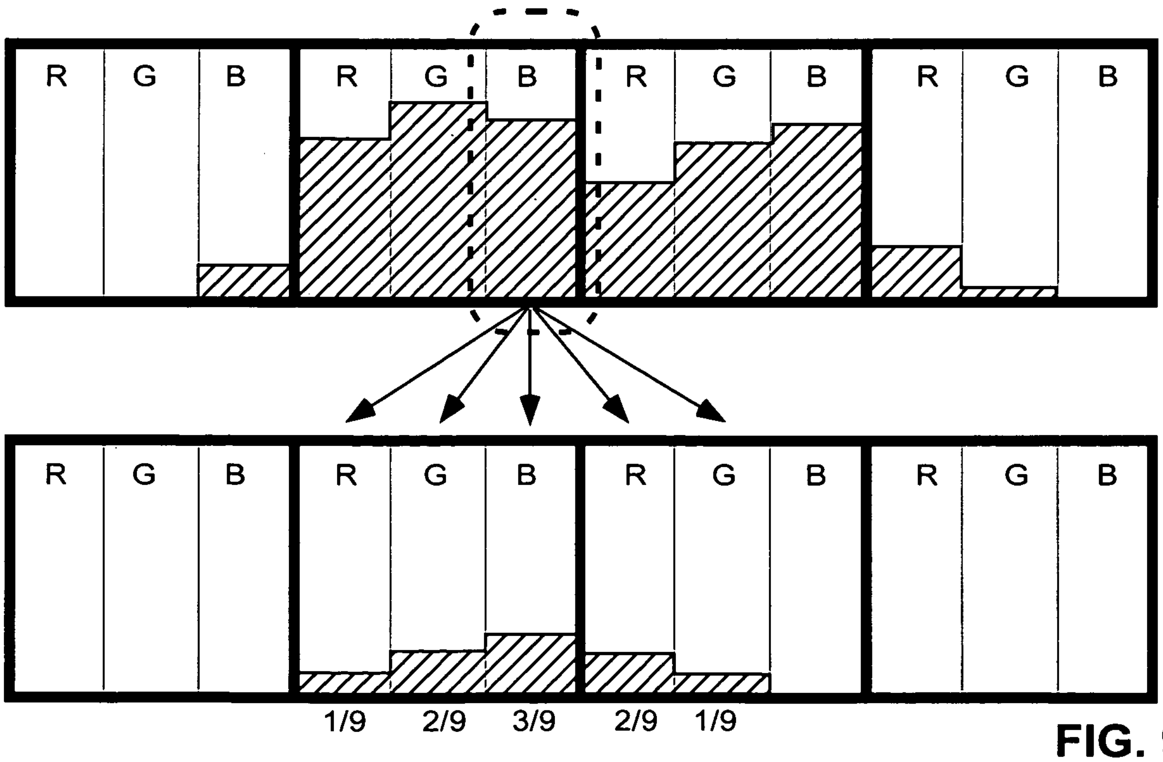


FIG. 93

-Center-Weighted Color Balance Filter~9400

-For Coverage Value 0	0,0,0,0,0
-For Coverage Value 31	0,1,1,1,0
-For Coverage Value 62	0,2,2,2,0
-For Coverage Value 93	1,2,3,2,1
-For Coverage Value 126	1,3,4,3,1

FIG. 94

-Asymetric Color Balance Filter~9500

-For Coverage Value 0	0,0,0,0,0
-For Coverage Value 31	1,1,1,0,0
-For Coverage Value 62	2,2,2,0,0
-For Coverage Value 93	3,3,3,0,0
-For Coverage Value 126	3,3,4,1,1

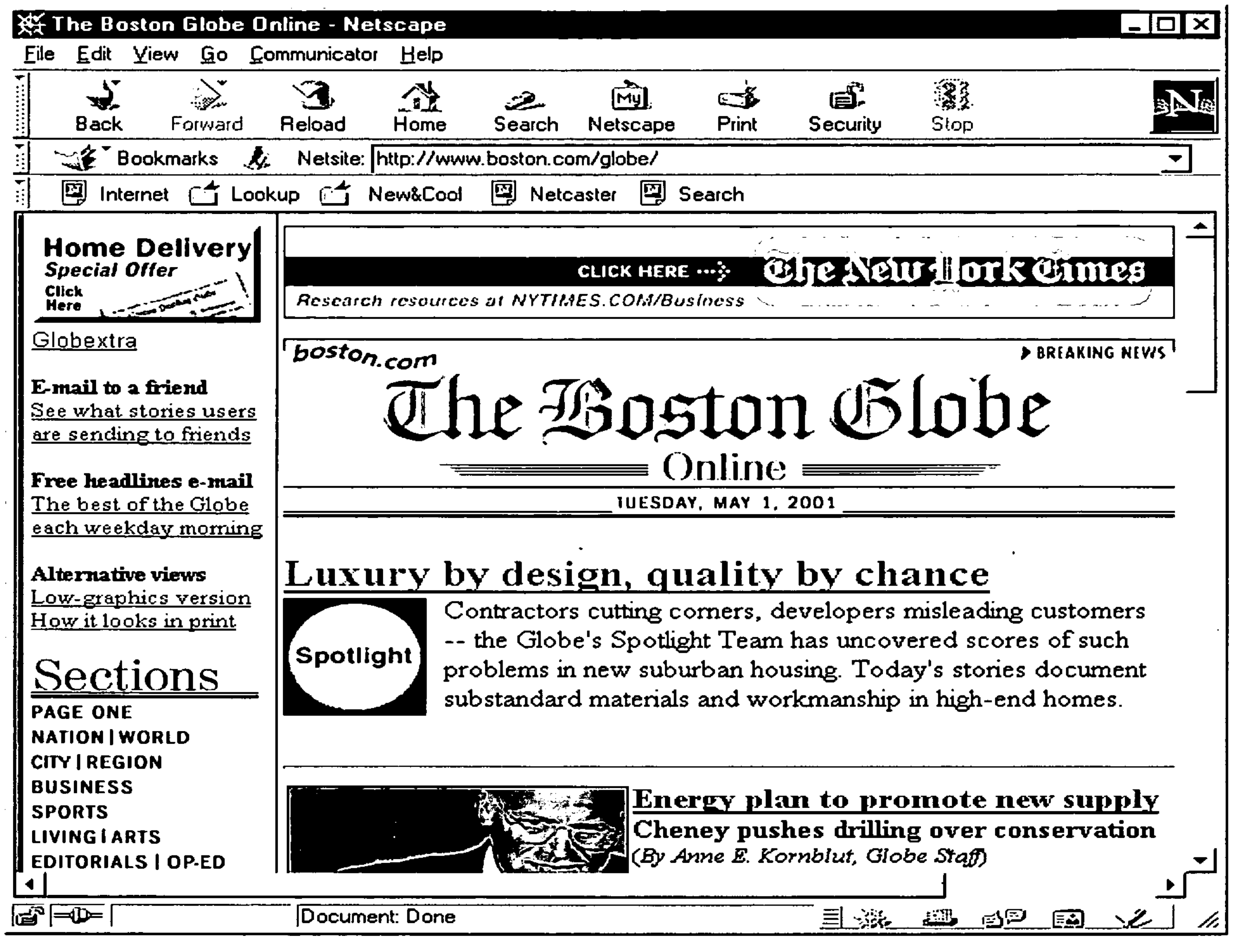
FIG. 95

```
-Creation of input-color-to-output-color look-up table~9600
    -run the characters of multiple fonts through non-linear algorithm for deriving
    subpixel optimized font bitmaps, while keeping a histogram of the number of
    times each of one of the 2196 possible three color alpha values is calculated for
    a pixel~9602
    -create a 122 color output palette by~9604
        -selecting the thirteen grayscale colors possible for whole pixel alpha
        values in which each subpixel can have one of thirteen levels including,
        black and white~9606
        -selecting the 109 other most frequently occurring colors in the
        histogram~9608
    -for each of the 2196 possible calculated alpha values~9610
        -if that input color exactly matches one of the pallette's colors~9612
            -associate the input color with that palette, or output, color~9614
        -if not~9616
            -for each of 122 output colors~9618
                -if (ri-ro) and (gi-go) are of same sign and if
                $|ro-go| < |ri-gi|+x$~9620
                    -calculate the distance from the input color to the
                    output color~9622
                    -if that distance is the closest distance so far to the
                    input color~9624
                        -save it as closestAllowedPaletteColor~9626
            -associate the input color with the
            closestAllowedPaletteColor~9628
```

FIG. 96

```
-Displaying text with font bitmaps having subpixel alpha value components ~9700
    -for each string to be displayed~9702
        -sample points in rectangle of bitmap in which it is to be drawn to
        determine its background color~9704
        -for each of the 122 whole pixel alpha values used to represent font
        bitmaps~9706
            -for each of the three subpixel component colors~9708
                -calculate color luminosity for the subpixel component color
                as the current subpixel's alpha value in the current whole
                pixel alpha value ( the current supixel's alpha) times
                luminosity of the current subpixel color in the foreground
                color with which the fonts are to be drawn plus (1 minus the
                current subpixel's alpha) times the luminosity of the current
                subpixel's color in the background color~9710
            -map the current whole pixel alpha value to the whole pixel color
            comprised of the three subpixel luminosities calculated for the
            whole pixel alpha value~9712
        -for each character of string to be displayed~9714
            -access its associated font bitmap~9716
            -for each of pixel of the font bitmap~9718
                -find the color value which has been mapped to the pixel's
                corresponding whole pixel alpha value in the font
                bitmap~9720
                -set the corresponding pixel in the subpixel addressable
                display to that whole pixel color value~9722
```

FIG. 97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The Boston Globe Online

TUESDAY, MAY 1, 2001

Luxury by design, quality by chance

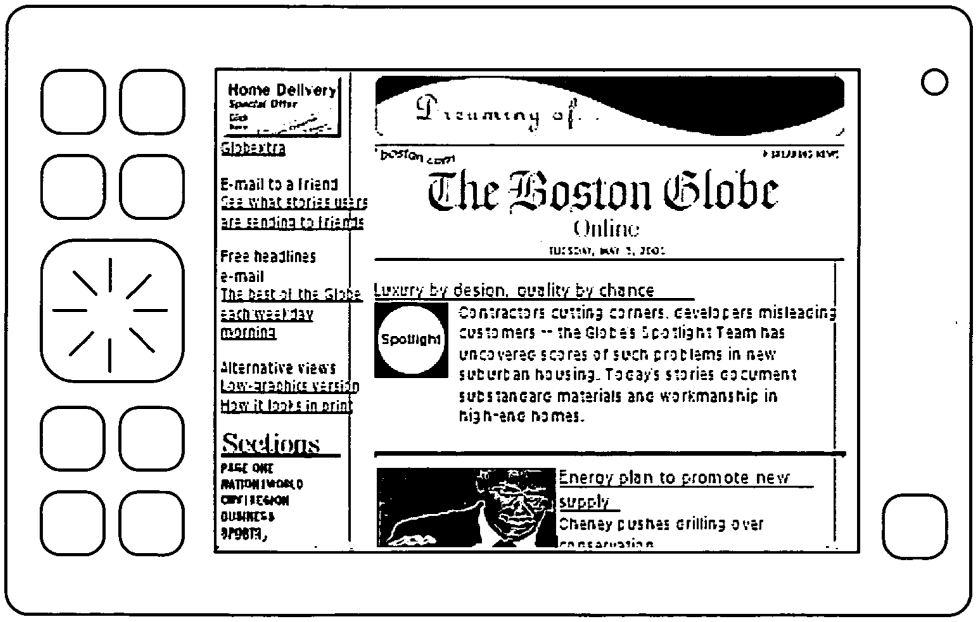
Spotlight

Contractors cutting corners, developers misleading customers -- the Globe's Spotlight Team has uncovered scores of such problems in new suburban housing. Today's stories document substandard materials and workmanship in high-end homes.

Energy plan to promote new supply
Cheney pushes drilling over conservation
(*By Anne E. Kornblut, Globe Staff*)

Document: Done

FIG. 98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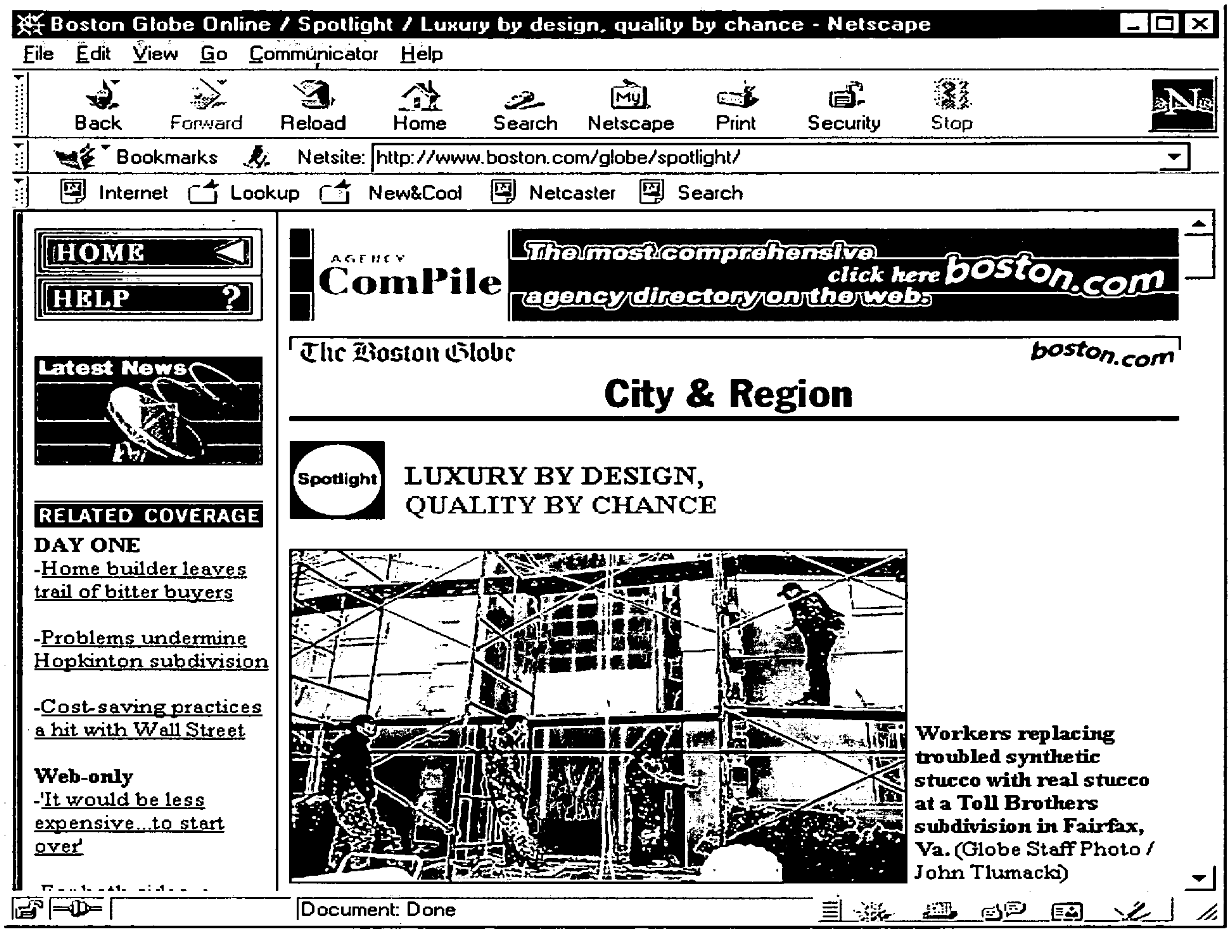
Spotlight
Contractors cutting corners, developers misleading customers -- the Globe's Spotlight Team has uncovered scores of such problems in new suburban housing. Today's stories document substandard materials and workmanship in high-end homes.
Energy plan to promote new supply
Cheney pushes drilling over

FIG. 99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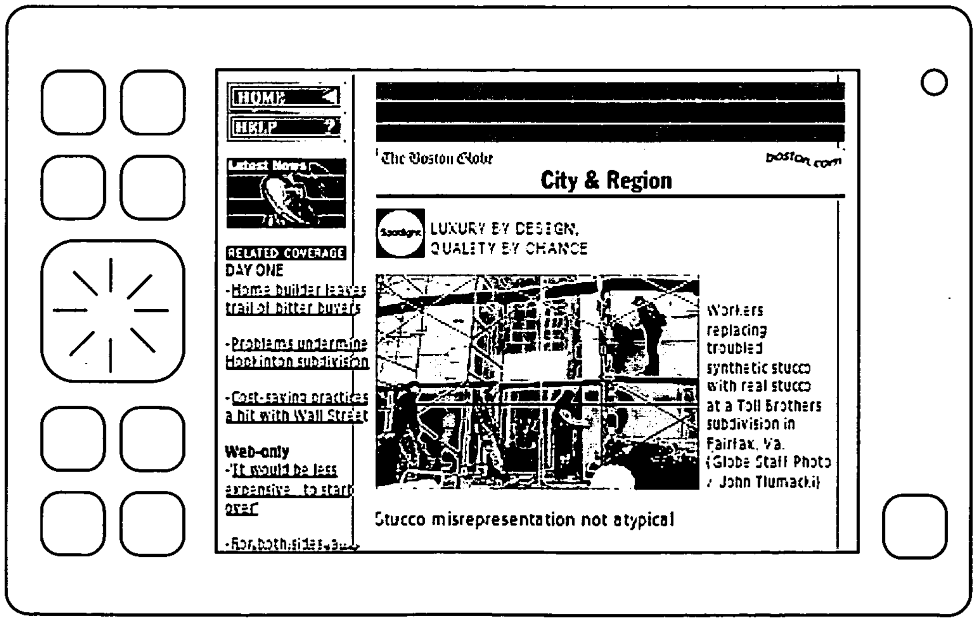
City & Region

Spotlight LUXURY BY DESIGN, QUALITY BY CHANCE

Workers replacing troubled synthetic stucco with real stucco at a Toll Brothers subdivision in Fairfax, Va. (Globe Staff Photo / John Tlumacki)

Document: Done

FIG. 100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-Problems undermine Hopkinton subdivision
-Cost-saving practices a hit with Wall Street
Web-only
-'It would be less expensive...to start over'
-For both sides, a...

The Boston Globe boston.com
City & Region
LUXURY BY DESIGN, QUALITY BY CHANCE
Workers replacing troubled synthetic stucco with real stucco at a Toll Brothers subdivision in Fairfax, Va. (Globe Staff Photo / John Tlumacki)
Stucco misrepresentation not atypical

FIG. 101

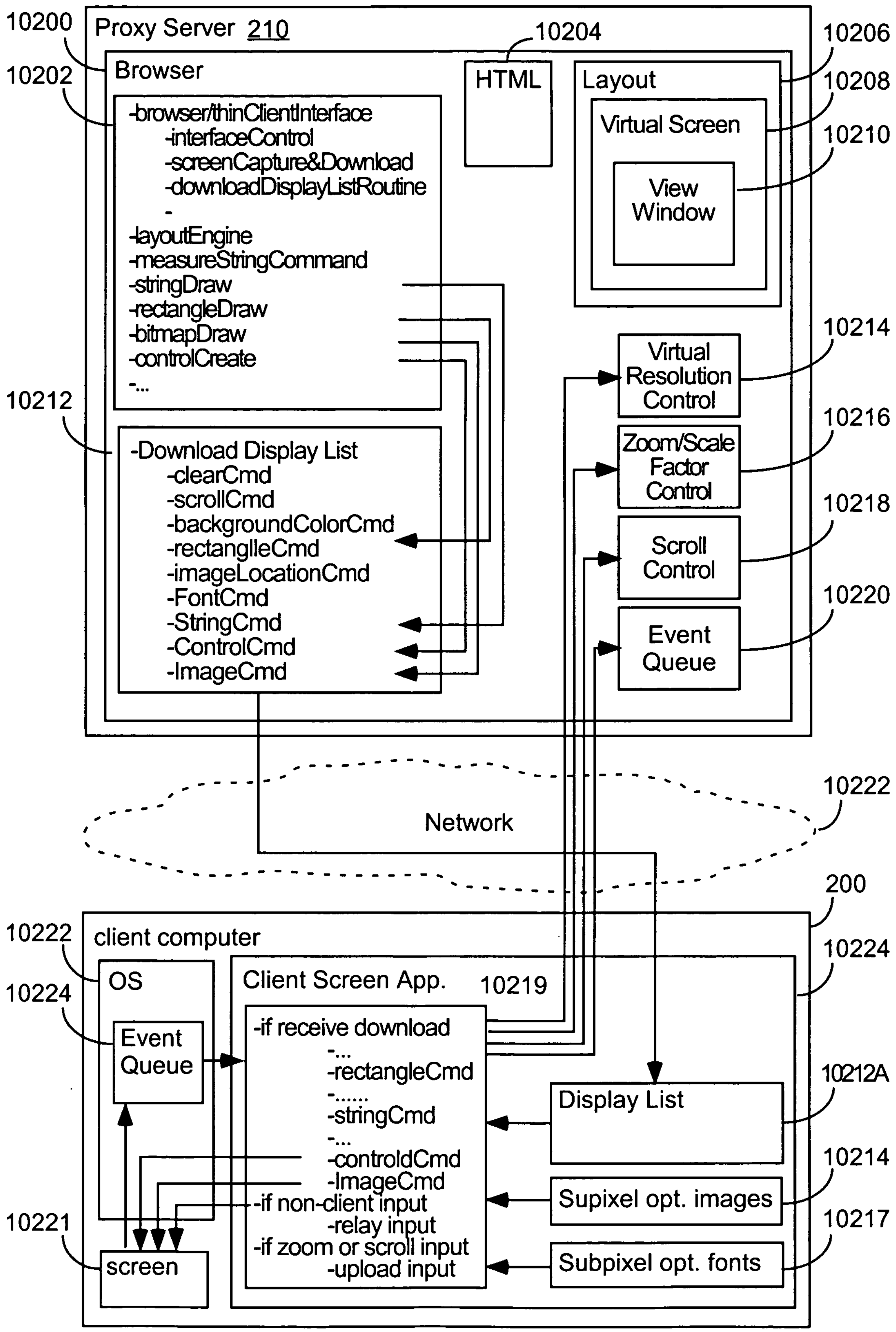

10200
Proxy Server 210
10204
10206
10202
Browser
HTML
Layout
10208
Virtual Screen
10210
-browser/thinClientInterface
-interfaceControl
-screenCapture&Download
-downloadDisplayListRoutine
-
-layoutEngine
-measureStringCommand
-stringDraw
-rectangleDraw
-bitmapDraw
-controlCreate
-...
View Window
Virtual Resolution Control
10214
10212
Zoom/Scale Factor Control
10216
-Download Display List
-clearCmd
-scrollCmd
-backgroundColorCmd
-rectanglleCmd
-imageLocationCmd
-FontCmd
-StringCmd
-ControlCmd
-ImageCmd
Scroll Control
10218
Event Queue
10220
Network
10222
200
10222
client computer
10224
OS
Client Screen App.
10219
10224
Event Queue
-if receive download
-...
-rectangleCmd
-......
-stringCmd
-...
-controldCmd
-ImageCmd
-if non-client input
-relay input
-if zoom or scroll input
-upload input
Display List
10212A
Supixel opt. images
10214
10221
screen
Subpixel opt. fonts
10217

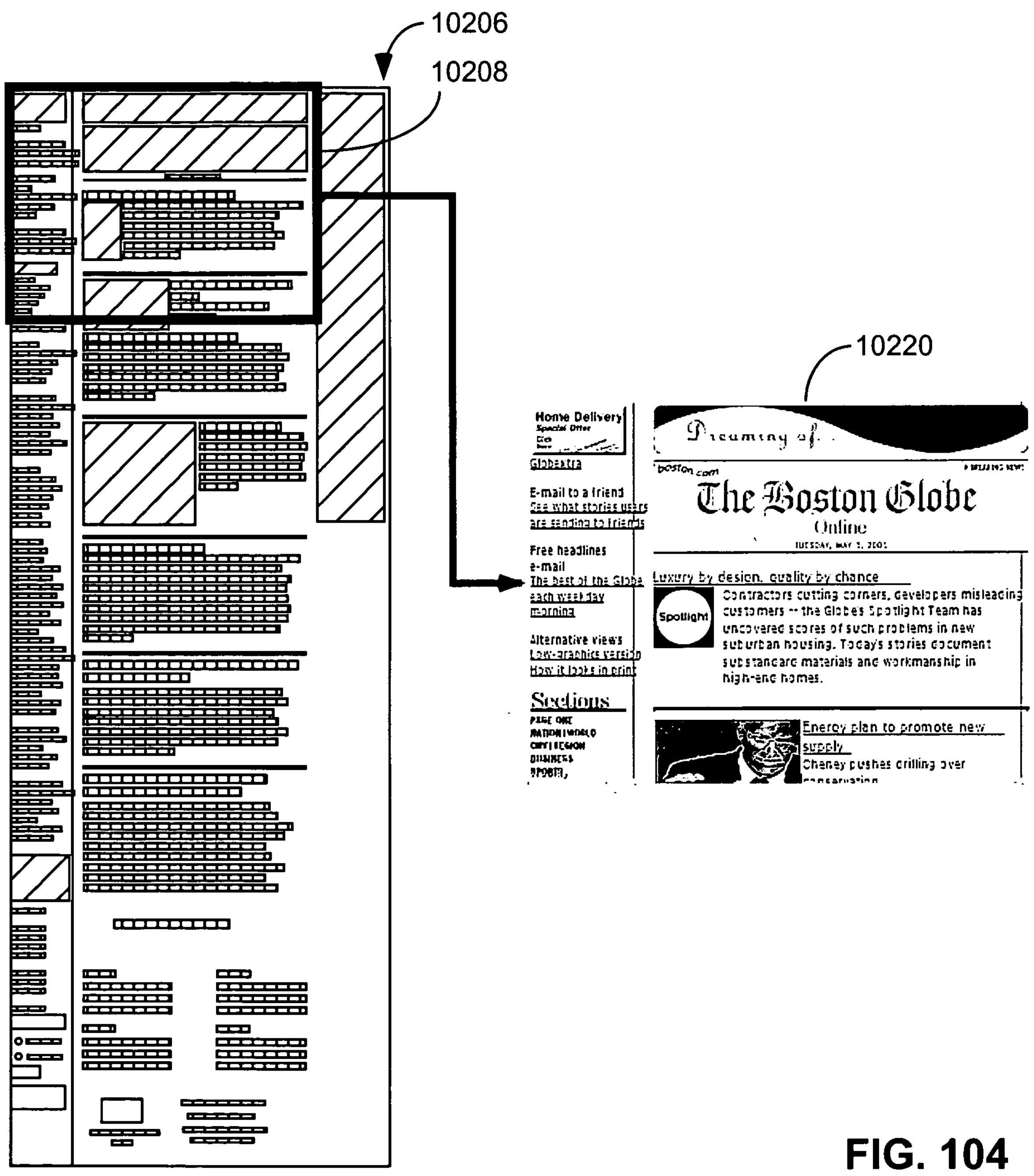
FIG. 102

-Sample html~10300

```
-</head>

-<body
background="http://a1636.g.akamai.net/7/1636/797/e5e77dd148cc98/graphics.
boston.com/globe/images/tiles/tile.gif" link="5C3317" vlink="5C4033"
onLoad="FrameThis()">
-...
-...
-<p>                 10300
                                                10300
-<B>E-mail to a friend</b><BR>
-<a href="http://tools.boston.com/pass-it-on/popular/">See what stories users
are sending to friends</a><p>
                   10300                    10300
-<B>Free headlines e-mail</B><br>
-<a href="/newsletters/headlines/">The best of the Globe each weekday
morning</a><p>      10300
                                        10300
-<B>Alternative views</b><BR>
-<a href="/globe/lowgraphics">Low-graphics version</a><br>
-<a href="/globe/acrobat/today.pdf">How it looks in print</a>
-<p>       10302
                                          10300
-<!--SECTIONS-->
-<IMG WIDTH="120" HEIGHT="27"
SRC="http://a1636.g.akamai.net/7/1636/797/0df5e88d0bb528/graphics.boston.
com/globe/images/navs/nsections.gif" border="0" alt="Sections" VSPACE="1"
WIDTH="120" HEIGHT="27"><BR>
-<a href="/globe" onMouseOver="loadimage('pageone',
'http://graphics.boston.com/globe/images/navs/rpageone.gif'); status='Boston
Globe Online: Page One'; return true;" onMouseOut="loadimage('pageone',
'http://graphics.boston.com/globe/images/navs/npageone.gif'); status=''; return
true;"><IMG WIDTH="119" HEIGHT="14"
SRC="http://a1636.g.akamai.net/7/1636/797/f0a63d528dc7e3/graphics.boston.
com/globe/images/navs/npageone.gif" border="0" alt="Boston Globe Online:
Page One" name="pageone" VSPACE="1"></a><br>
-...
-...
```

FIG. 103



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The Boston Globe
Online
TUESDAY, MAY 1, 2001

Luxury by design, quality by chance

Spotlight

Contractors cutting corners, developers misleading customers -- the Globe's Spotlight Team has uncovered scores of such problems in new suburban housing. Today's stories document substandard materials and workmanship in high-end homes.

Energy plan to promote new supply

Cheney pushes drilling over conservation

FIG. 104

```
-Browser's Proxy Code~10500
    -...
    -if receive request from thin client for a web page~10502
        -relay request to server indicated in URL of request~10504
    -if receive indication that browser has completed a screen draw or
    redraw~10506
        -call the screen capture and download routine when screen redraw is
        complete ~10510
    -if receive control object state query from browser~10514
        -query thin client for state of indicated one or more controls~10516
        -send those control states to browser~10518
    -if receive scroll/move command from thin client~10520
        -move view window accordingly relative to browser's virtual
        screen~10522
        -if portion of view window which was in view window before move is still
        in view window~10526
            -place appropriate scroll command at start of download display
            list~10528
        -if moved view window includes portion of web page not currently in
        virtual screen~10530
            -scroll browser's virtual screen accordingly~10532
            -request redraw for the newly scrolled virtual screen from
            browser~10534
    -if receive zoom command from thin client~10536
        -change view scale factor accordingly~10538
        -scale view window accordingly relative to browser's virtual
        screen~10540
        -if scaled view window includes portion of web page not currently in
        virtual screen~10542
            -scroll virtual screen change its resolution to cause scaled view
            window to fit in virtual screen~10544
        -call for screen redraw~10552
```

FIG. 105A

```
-if receive virtual resolution command from thin client~10554
    -change browser's virtual screen resolution to requested virtual
    resolution~10556
    -call for screen redraw~10560
-if receive other user input event from thin client~10562
    -transform its screenXY on client screen to corresponding location in
    browser screen using location of view window and display scaling
    factor~10564
    -relay event to browser's event queue~10566
-...
```

FIG. 105B

```
-Screen Capture And Download Routine~10600
    -ask for browser for screen redraw~10602
    -if browser calls~10604
        -measureString~10606
            -map requested font family and font size into substitute font family
            and size, including:~10608
                -select size for substitute fonts as a function of the
                requested font size and downscaling by the display scaling
                factor~10610
                -replace smaller size fonts with narrower and taller size to
                take advantage of the higher ratio of horizontal resolution of
                subpixels~10612
                -if limitMinimumFontSize is on~10614
                    -prevent substitute font size from being below a
                    minimum pixel size~10616
            -return string measurement for substituted font and font size,
            scaled up measurements by display scale factor~10618
        -stringDraw~10620
            -transform string's virtual screen screenXY to thin client screenXY
            by scaling and/or translating as a function of the display scale
            factor and the view window's position relative to virtual
            screen~10621
            -if substituted font family and size associated with string in prior
            measure string call and any other font attributes for string is
            different than current font attribute for end of display list~10622
                -store a font command at end of display list changing
                current font attributes to attributes corresponding to current
                string~10623
            -store string, its thin-client screenXY, and its substituted font,
            including size and color, at end of download display list~10624
        -rectangleDraw~10626
            -transform rectangle's virtual screen screenXY, width, and height
            to thin client screenXY, width and height by scaling and/or
            translating as a function of the display scale factor and the view
            window's position relative to virtual screen~10628
            -if rectangle's color is different than background color for current
            end of download display list~10630
                -add a background color command changing to new
                background color at end of download display list~10632
            -store rectangle, transformed screenXY, width, and height at end
            of download display list~10634
```

FIG. 106A

```
-bitmapDraw~10636
    -if images URL is not already in a download image list~10638
        -if bitmap is color bitmap~10642
            -scan image for one or more portions of sufficient
            size which have only colors from a given bicolor
            spectrum~10644
            -for each bicolor portion of image found~10646
                -perform bicolor subpixel optimization, scaled
                down by display scale factor, on portion using
                opposite ends of its bicolor spectrum as
                foreground and background color at display
                scale factor~10648
                -if foreground color is too chromatically
                unbalanced, render image with a substituted
                more-balanced foreground color~10650
            -for each non-bicolor portion of image found~10652
                -perform multicolor subpixel optimization,
                scaled down by display scale factor, on
                bitmap using color image subpixel algorithm
                at display scale factor~10654
        -else if bitmap is grayscale bitmap~10656
            -perform bicolor subpixel optimization, scaled down
            by display scale factor, on bitmap using black and
            white as foreground and background colors at
            display scale factor~10658
        -store scaled-down, subpixel-optimized bitmap, with a
        unique imageID, transformed width and height, and its URL
        at end of image list~10662
    -transform image's screenXY for download and store an image
    location command having the imageID and the transformed
    screenXY, width, and height stored for the image in the image list
    at end of download display list~10664
```

FIG. 106B

```
-controlCreate~10666
        -transform control's screenXY by scaling and/or translating as a
        function of the display scale factor and the view window's position
        relative to virtual screen~10667
        -place corresponding control command, its transformed screenXY,
        and corresponding text  in download list~10668
        -create corresponding browser-side portion of distributed
        control~10670
-...
```

```
-when screen redraw is complete~10672
    -call download display list routine~10674
    -clear display list~10676
```

FIG. 106C

```
-download display list routine~10700
    -select all elements in display list which will be all or partially be included in the
    new image which is to be created on the thin client's display screen in a
    download stream~10702
    -place all bitmaps in image list corresponding to one or more image locations
    commands in download stream at end of download stream, performing lossy
    compression on them first~10704
    -user a lossless compression algorithm to compress download stream~10705
    -open  a the socket connection between browser's computer and thin
    client~10706
    -send display list to thin client over socket connection~10708
```

FIG. 107

-Download Stream~10800

-clearCmd~10802
-scrollCmd + XYShift~10804
-...
-backgroundColorCmd + color~10806
-rectanglleCmd +ScreenXY + width + Height~10808
-rectanglleCmd +ScreenXY + width + Height~10808
-...
-backgroundColorCmd + color~10806

-imageLocationCmd + ImageID + ScreenXY+ width + height~10810
-FontCmd + FontAttribute1 + NewValue1 + FontAttribute2 +
NewValue2~10812...
-StringCmd + ScreenXY + String~10814
-StringCmd + ScreenXY + String~10814
-...
-imageLocationCmd + ImageID + ScreenXY+ width + height~10810
-FontCmd + FontAttribute3+ NewValue3...~10812
-StringCmd + ScreenXY + String~10814
-...
-StringCmd + ScreenXY + String~10814
-StringCmd + ScreenXY + String~10814
-rectanglleCmd +ScreenXY + width + Height~10808
-ControlCmd + ControlID + ControlType + ScreenXY + ControlTextList~10816
-StringCmd + ScreenXY + String~10814

-ControlCmd + ControlID + ScreenXY + Control Label~10816

-ImageCmd + ImageID + width + height + Bitmap~10818
-ImageCmd + ImageID + width + height + Bitmap~10818
-ImageCmd + ImageID + width + height + Bitmap~10818

FIG. 108

```
-thin client code~10900
    -...
    -if receive a download stream, start responding to individual commands in
    stream in the order in which they are received as soon as one or more are
    received, including responding to each of the following commands as
    follows~10902
        -clearCmd ~10904
            -clear thin client screen~10906
        -scrollCmd~10908
            -bitblit portion of screen which remains on screen after XYShift to
            appropriate position after that shift~10910
            -clear rest of screen~10912
        -backgroundColorCmd~10914
            -set current rectangle background color to the color specified in
            command~10916
        -rectangleCmd~10918
            -draw rectangle with upper left hand corner at ScreenXY, having
            the width and height specified in command, using current
            background color~10920
        -imageLocationCmd~10922
            -do nothing~10923
        -FontCmd + FontAttributer1 + NewValue1 + FontAttribute2 +
        NewValue2...~10924
            -set current value of all font attributes listed in command to the
            corresponding values listed in the command~10926
        -StringCmd + ScreenXY + String~10928
            -if thin client does not have font bitmap for each character of the
            specified string at the current font size and font family~10930
                -send separate HTTP request for font of each such bitmaps
                from font server, specifying size, character, font, and that is
                to be subpixel optimized, and subpixel array type~10932
                -when receive each requested font~10934
                    -place it in font bitmap cache~10936
            -if have all characters of string specified in the command~10938
                -draw string, using current font attributes values, including
                foreground color, and using color from portion of screen on
                which it is being written as the background color~10940
```

FIG. 109A

```
        -ControlCmd + ControlID + ControlType + ScreenXY +
        ControlTextList~10942
                -if no control has been created having controlID specified in
                command~10944
                        -create thin client side of distributed control associated with
                        that controlID~10946
                -draw specified control type on screen using subpixel optimized
                bitmaps for control image, at specified screenXY, using drawing
                one or more text items in controlTextList using subpixel optimized
                text, and set control's associated screen hotzone, if any to the
                appropriate portion of screen~10948
        -ImageCmd~10950
                -for each imageLocationCmds in display list having same
                ImageID~10952
                        -draw bitmap at that location~10954
                -redraw all other items in display list which occur at the same
                location as any of these drawn bitmaps~10956
        -...
-if user clicks hotzone assocated with text entry field~10958
        -execute keyboard mode routine~10960
                -display pop up user keyboard and text edit line, saving the bitmap
                which was in its location~10962
                -until user presses enter~10964
                        -if user user types text character~10966
                                -place corresponding subpixel-optimized text shape
                                on text edit line~10968
                                -add character to position corresponding to cursor in
                                a temporary text-edit string variable~10970
                        -...
                -when user press enter, ~10972
                        -store text-edit string state in corresponding text field
                        control~10974
                        -draw text-edit string in bitmap of text entry field using
                        subpixel optimized fonts~10976
                        -remove popup keyboard, replacing the bitmap with was in
                        its place before it was displayed~10978
-else if user clicks on hot zone of a button or menu item control~10980
        -change appearance of button or menu item appropriately~10981
        -send event along with button or menu item ID up to proxy~10982
-else if user clicks on hot zone of another type of thin client control~10983
        -change appearance of control appropriately~10984
        -store user selected state change~10985
-else if user clicks on other portion of screen not associated with the thin client
program's or its computer's control interface~10986
        -send even with screen location up to proxy~10987
```

FIG. 109B

```
-if receive query from proxy process re state of control~10988
        -query state of corresponding control on thin client~10989
        -transmit state to browser~10990
-if user enters a command to scroll screen~10991
        -upload command to proxy~10992
-if user enters a command to change zoom,~10993
        -upload command to proxy~10994
-if user enters a command to change virtual resolution,~10995
        -upload command to proxy~10996
-if user enters another command associated with thin client's control
GUI~10997
        -...~10998
```

FIG. 109C

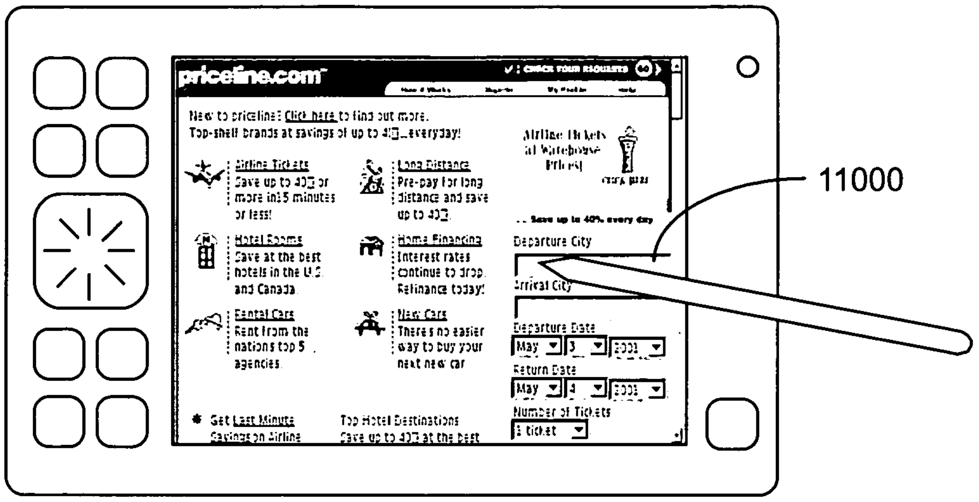
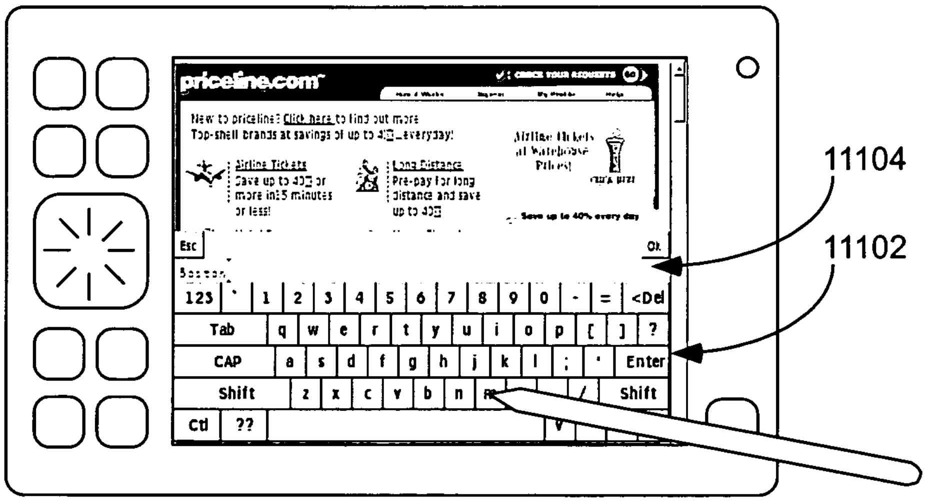


FIG. 110



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Esc
Ok
Boston
123 ` 1 2 3 4 5 6 7 8 9 0 - = <Del
Tab q w e r t y u i o p [ ] ?
CAP a s d f g h j k l ; ' Enter
Shift z x c v b n m / Shift
Ctl ??
11104
11102

FIG. 111

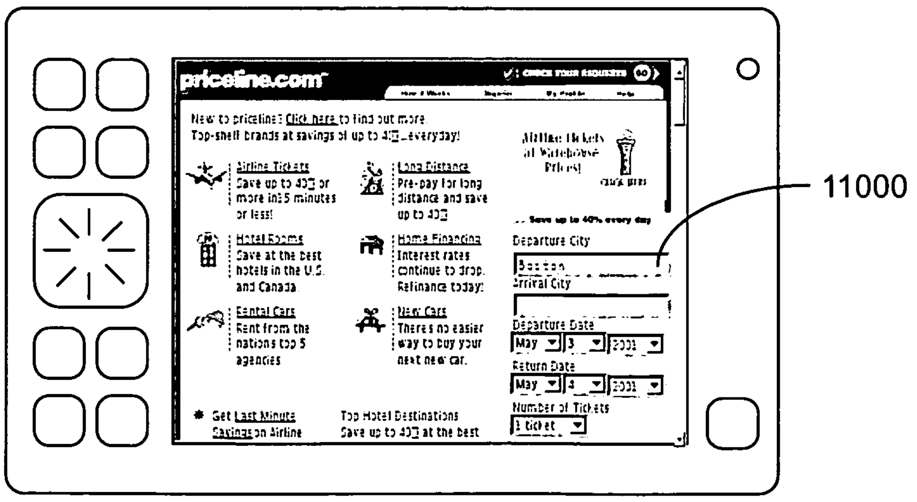
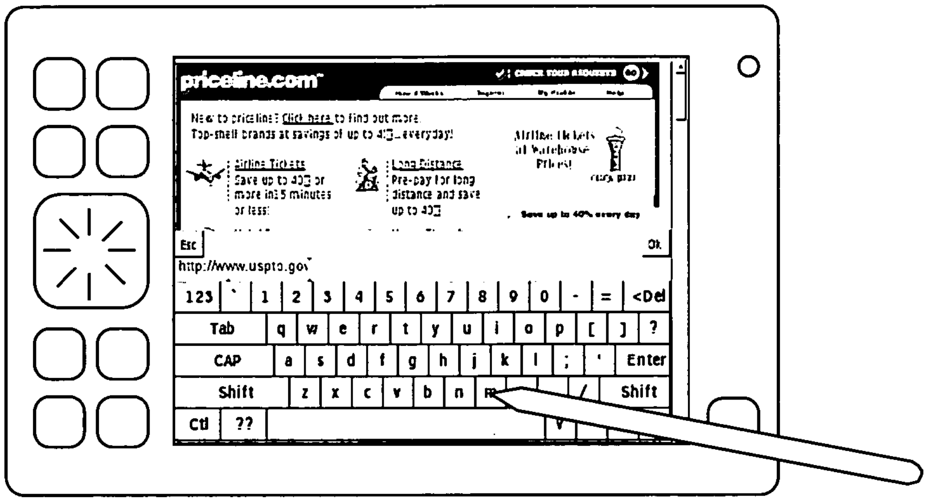


FIG. 112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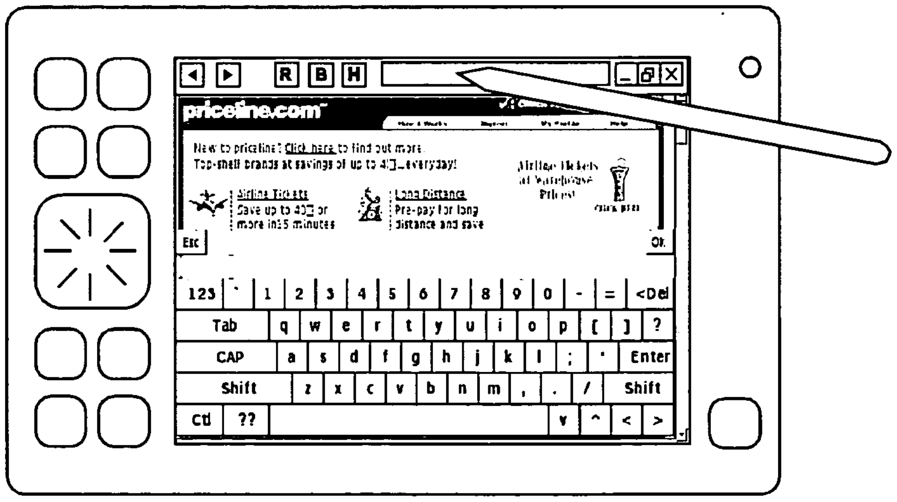
123 ` 1 2 3 4 5 6 7 8 9 0 - = <Del
Tab q w e r t y u i o p [ ] ?
CAP a s d f g h j k l ; ' Enter
Shift z x c v b n m / Shift
Ctl ?? v

FIG. 113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123 ` 1 2 3 4 5 6 7 8 9 0 - = <Del
Tab q w e r t y u i o p [ ] ?
CAP a s d f g h j k l ; ' Enter
Shift z x c v b n m , . / Shift
Ctl ?? v ^ < >

FIG. 114

```
-proxy browser code with use of page layout caching~11500
    -...
    -if receive request for web page with an associated view setting~11502
        -request web page from server~11504
    -when a web page is received from a server~11506
        -have layout engine layout web page at the virtual screen resolution
        specified in the view setting, substituting fonts for layout engine's
        measure string calls according to view setting's appropriate scale
        factor~11507
        -select virtual screen position relative to resulting layout which will fit the
        view window implicit in the view setting, and redraw screen~11508
        -when receive image referenced in web page~11518
            -scale and subpixel optimize image according to scale
            factor~11520
        -once have all images referenced in web page~11522
            -compress layout and images~11523
            -download layout followed by images~11524
    -if receive request from thin client to rescale and subpixel optimize bitmaps of
    images at a given scale~11526
        -rescale and subpixel optimize them~11528
        -compress them~11530
        -download them to thin client~11532
    -if input event from thin client~11534
        -if its layout coordinate associated with it is not currently on virtual
        screen~11536
            -scroll virtual screen so that it is~11538
        -calculate virtual screen coordinate corresponding to layout
        coordinate~11540
        -place input event with calculated virtual screen coordinate in browser's
        event queue ~11542
    -...
```

FIG. 115

```
-thin client code with use of page layout caching~11600
    -...
    -if start receiving downloaded page layout display list~11602
        -set mapping of view window to page layout and calculate scale factor as
        function of view selection~11604
        -display received elements of display list which fall within view window at
        current mapping of screen window to display list, including current scale
        factor~11606
    -if user generates input to changes size or location of view window relative to
    downloaded layout~11616
        -make the corresponding change to the mapping of view window to
        display list and calculate scale factor as function any such
        changes~11618
        -display any portions of page layout which fall within current view window
        at current scale factor including~11620
            -displaying strings with font sizes which are function of current
            scale factor, and adjusting for disproportionate changes in size of
            individual or all characters as font sizes change, by changing
            spacing between characters~11622
            -if there is a new scale factor~11624
                -requesting proxy to re-scale at new scale factor and
                subpixel optimize all images on screen at new
                mapping~11626
                -scaling at new scale factor and re-subpixel optimizing, and
                displaying the previously downloaded bitmaps of all on-
                screen images~11628
                -when newly scaled images are received, displaying them
                in place of locally rescaled versions~11630
    -if user generates input event relative to screen~11632
        -use view-window-to-page-layout mapping to determine location of input
        in layout cooridinates~11634
        -send input event and page layout coordinates to proxy~11636
```

FIG. 116

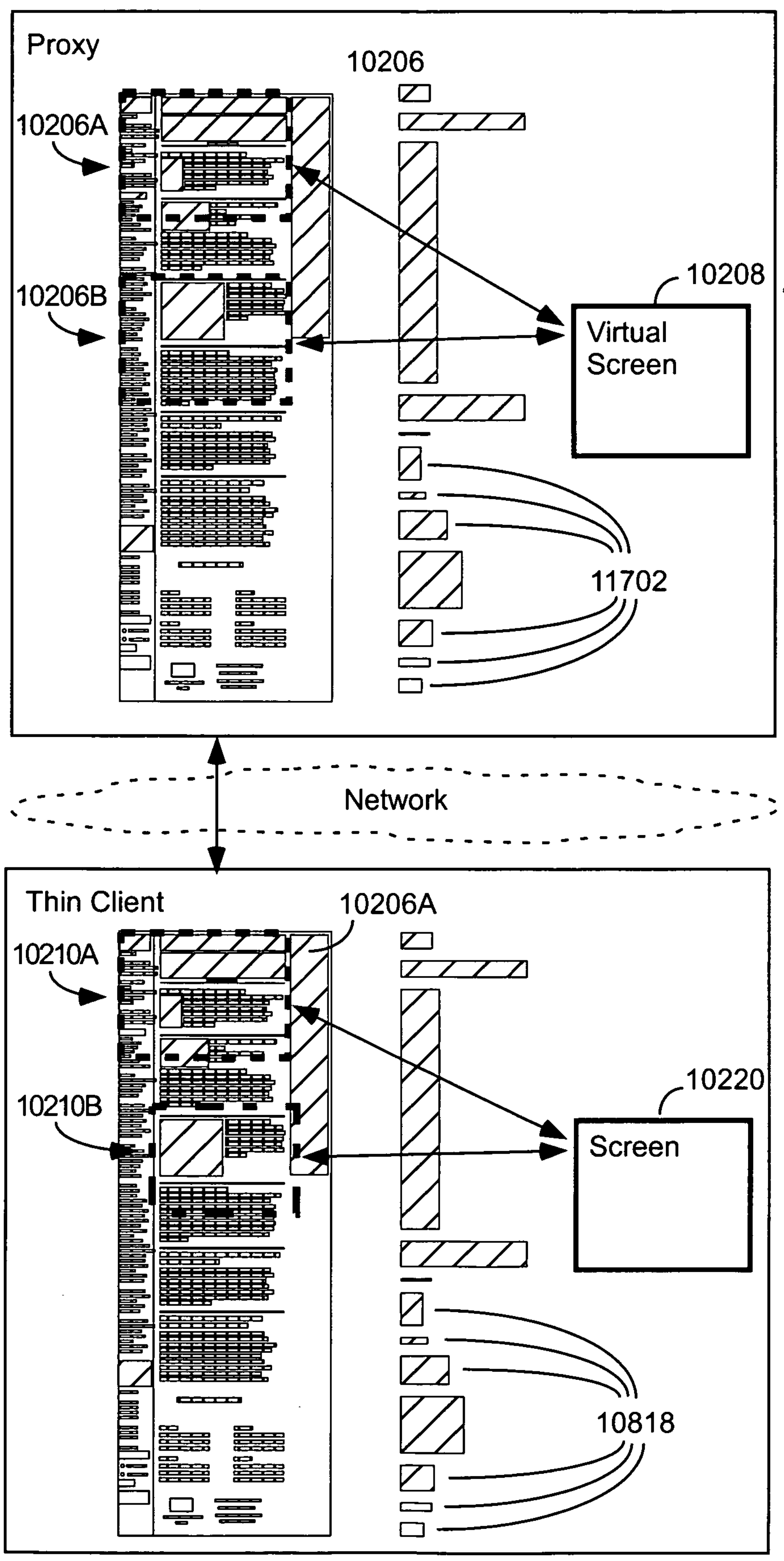
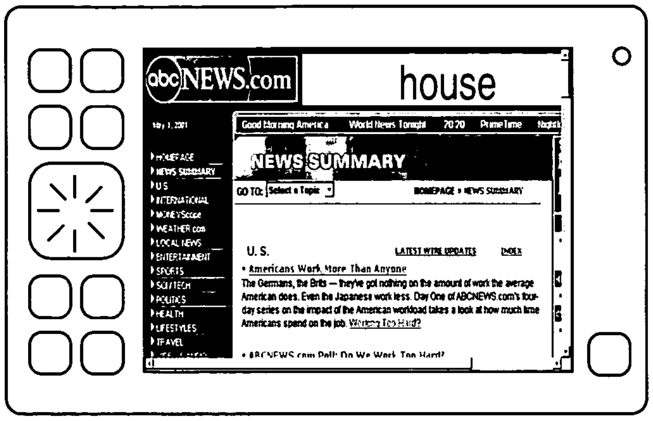

Proxy
10206
10206A
10206B
10208
Virtual Screen
11702
Network
Thin Client
10206A
10210A
10210B
10220
Screen
10818

FIG. 117



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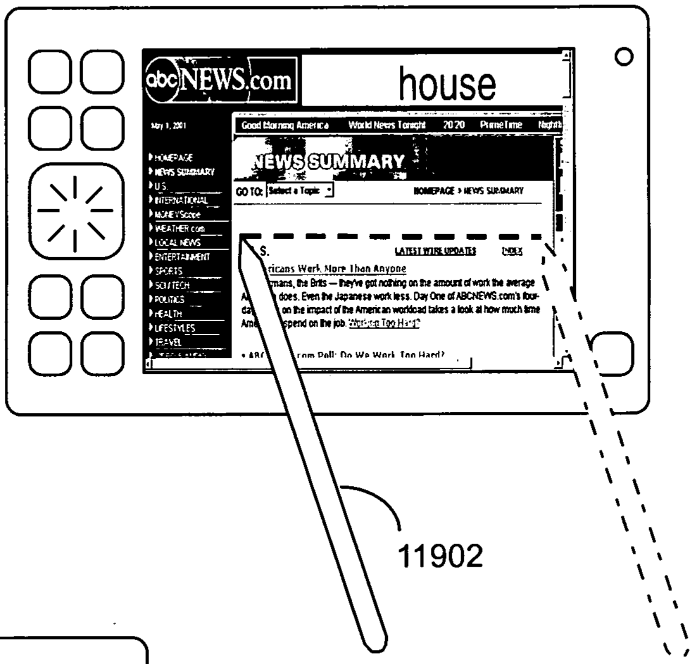
• ABCNEWS.com Poll: Do We Work Too Hard?

FIG. 118



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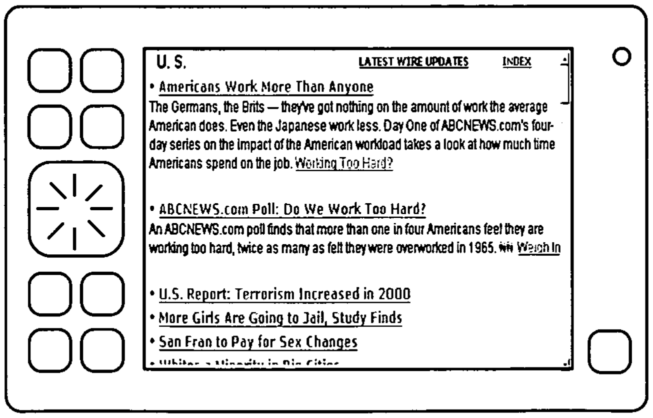
• ABC com Poll: Do We Work Too Hard?

FIG. 119



U. S. LATEST WIRE UPDATES INDEX

• Americans Work More Than Anyone

The Germans, the Brits — they've got nothing on the amount of work the average American does. Even the Japanese work less. Day One of ABCNEWS.com's four-day series on the impact of the American workload takes a look at how much time Americans spend on the job. Working Too Hard?

• ABCNEWS.com Poll: Do We Work Too Hard?

An ABCNEWS.com poll finds that more than one in four Americans feel they are working too hard, twice as many as felt they were overworked in 1965. Weigh In

• U.S. Report: Terrorism Increased in 2000

• More Girls Are Going to Jail, Study Finds

• San Fran to Pay for Sex Changes

FIG. 120

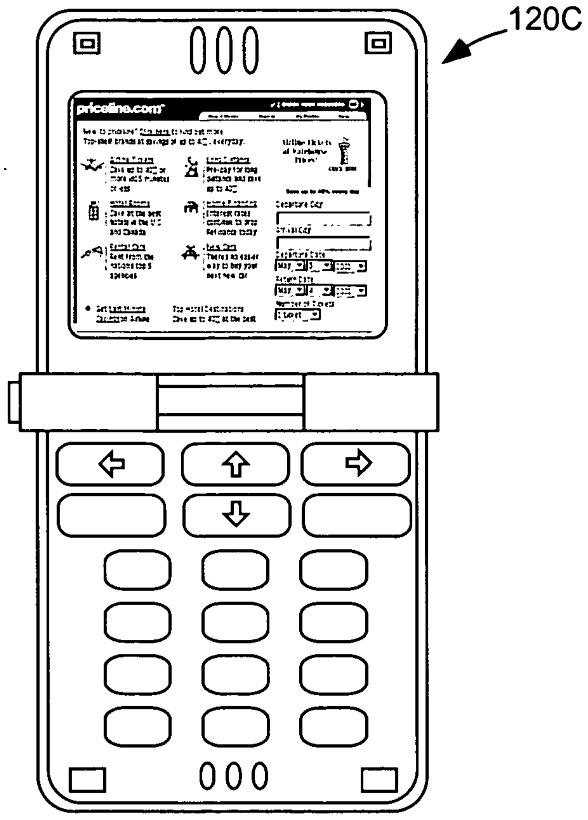


FIG. 121

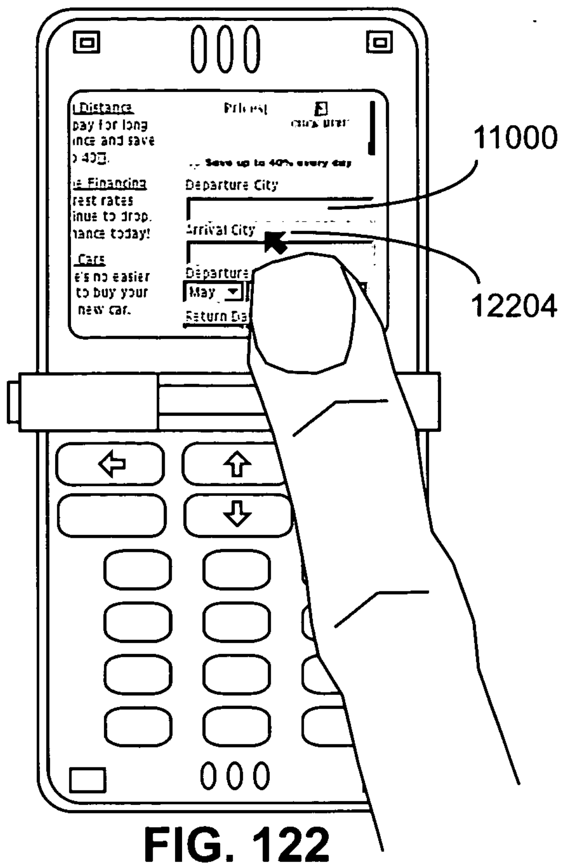


FIG. 122

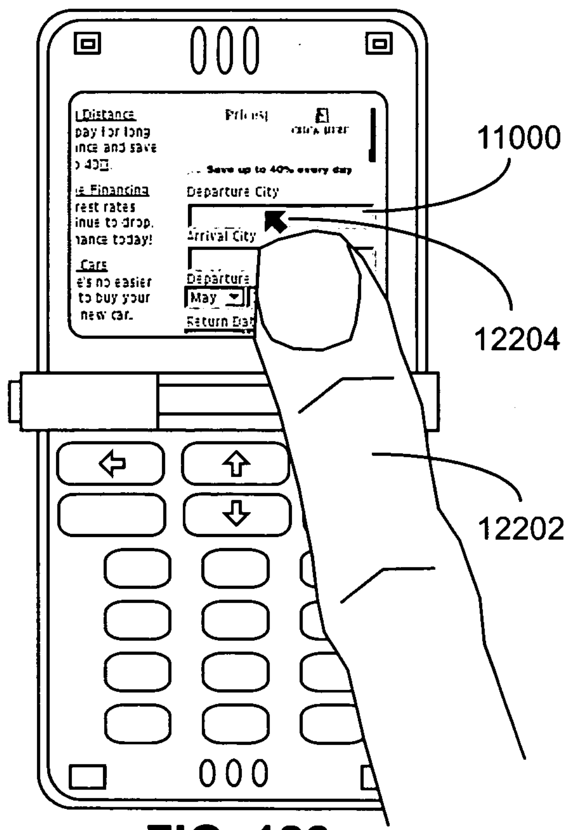


FIG. 123

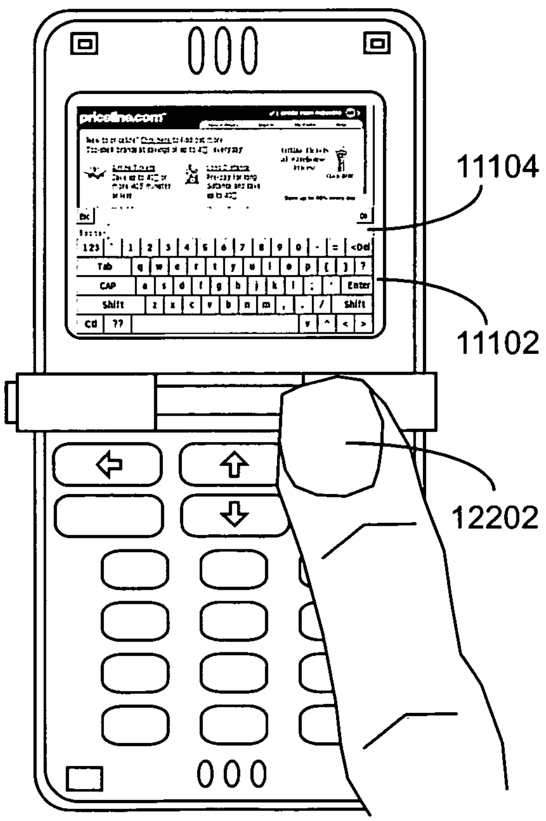


FIG. 124

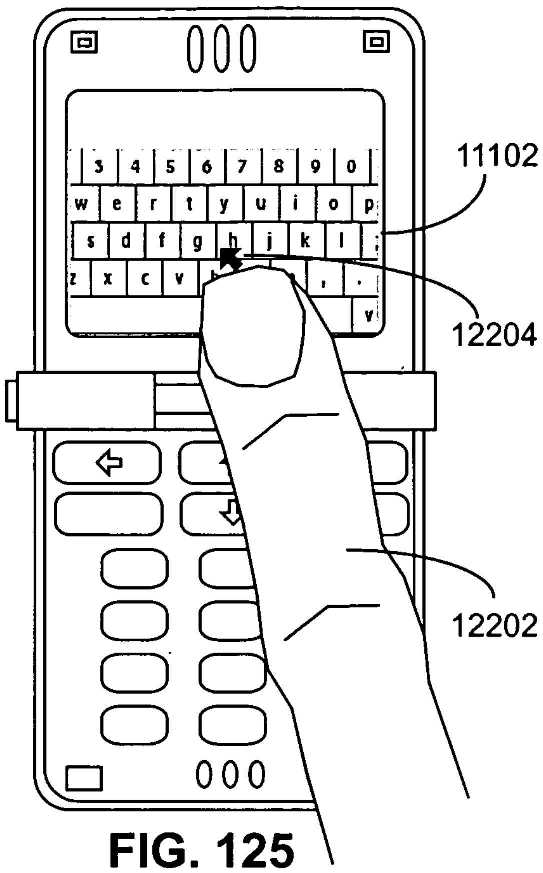


FIG. 125

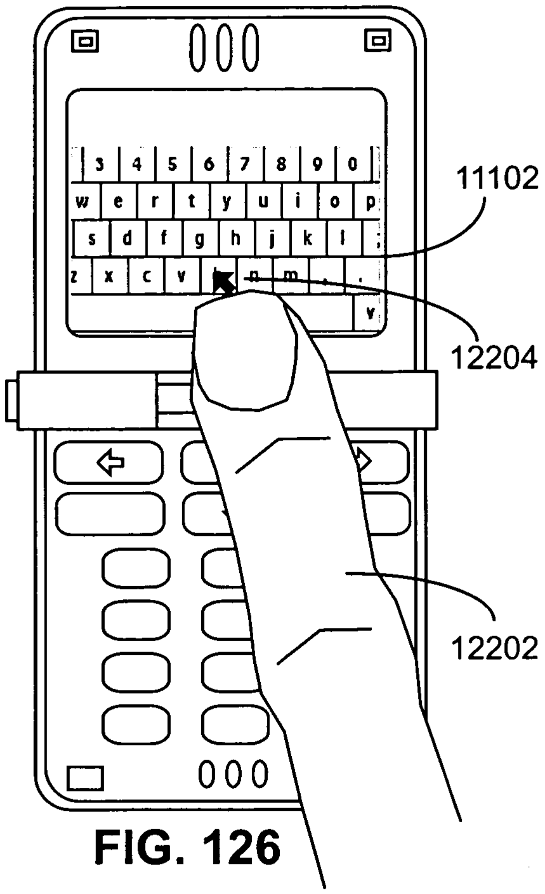


FIG. 126

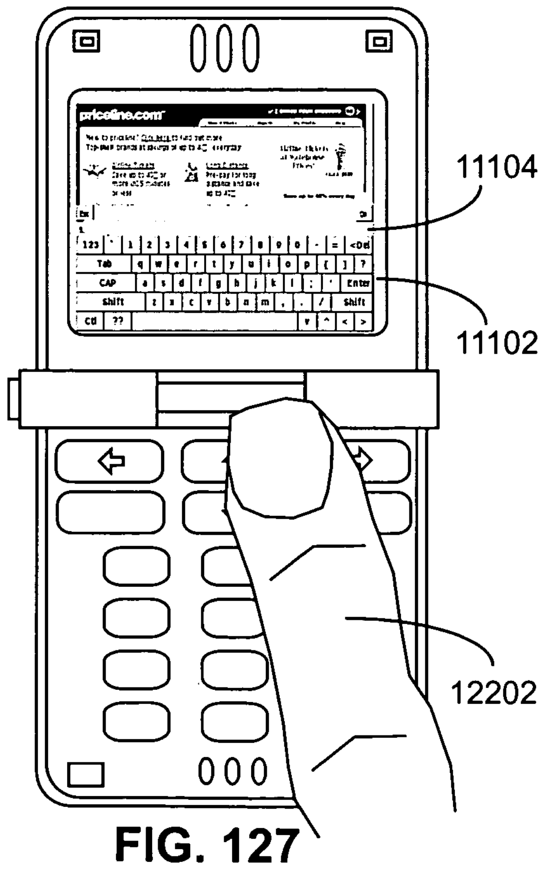


FIG. 127

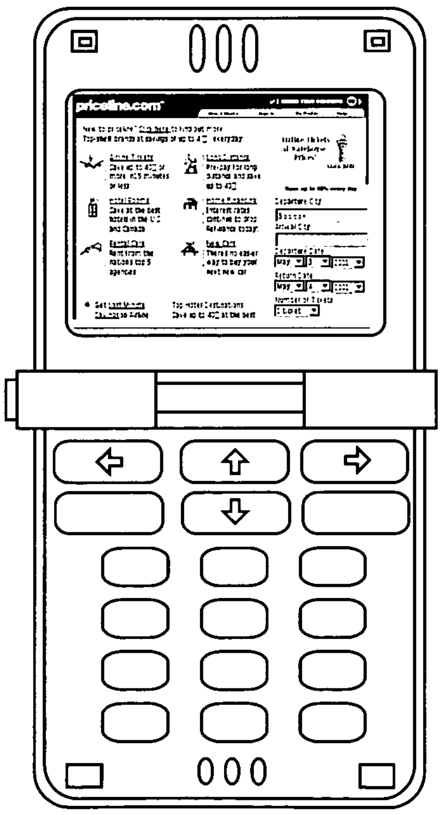
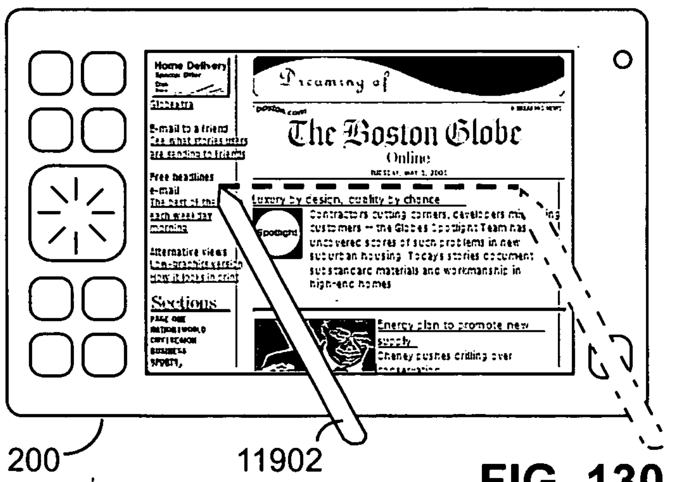


FIG. 128

```
-Client code for selected text reflow~12900
        -If user selects area of downloaded page layout for text reflow at a new scale
        factor~12902
-select all strings and corresponding underlines in layout which are substantially within
                selected layout area~12904
                -label any group of one or more strings whose closeness in layout
                indicates that they are part of the same paragraph~12906
                -reflow and display the text of each group of strings labeled as a
                paragraph across screen area's across boundaries at new scale factor,
                underlining text in reflowed lay that was underlined before~12908
```

FIG. 129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Cheney pushes drilling over conservation
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FIG. 130

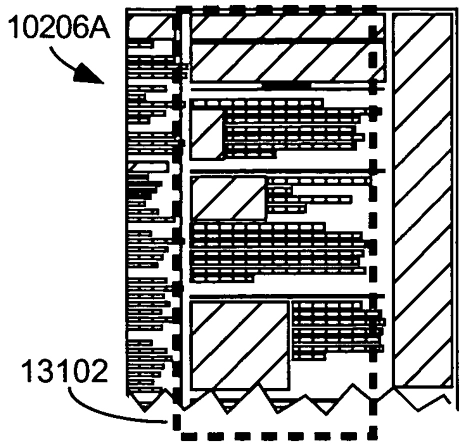
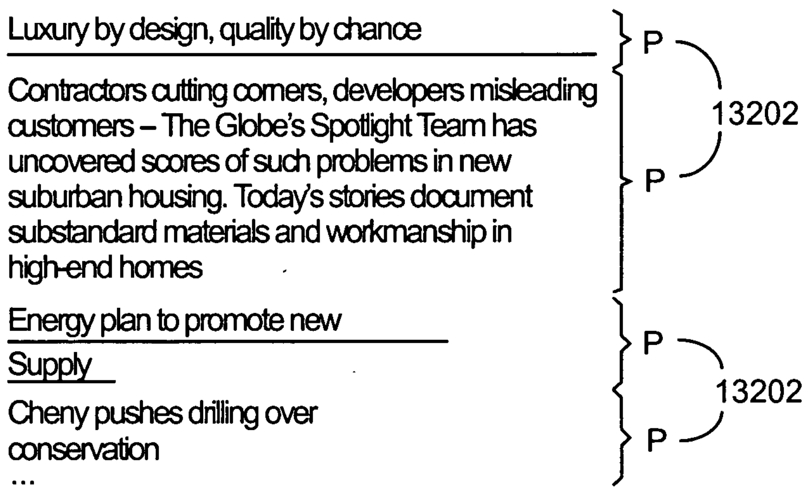


FIG. 131



Luxury by design, quality by chance

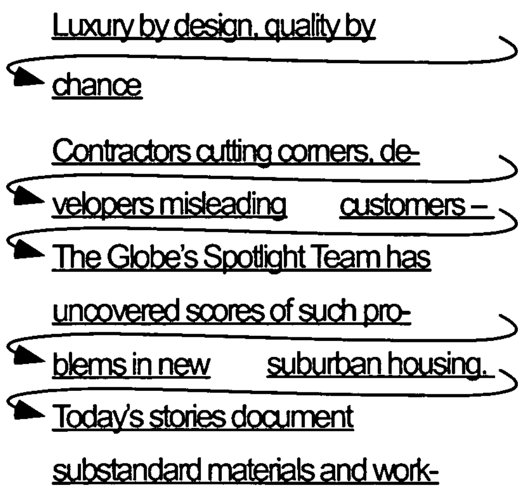
Contractors cutting corners, developers misleading customers – The Globe's Spotlight Team has uncovered scores of such problems in new suburban housing. Today's stories document substandard materials and workmanship in high-end homes

Energy plan to promote new Supply

Cheney pushes drilling over conservation

...

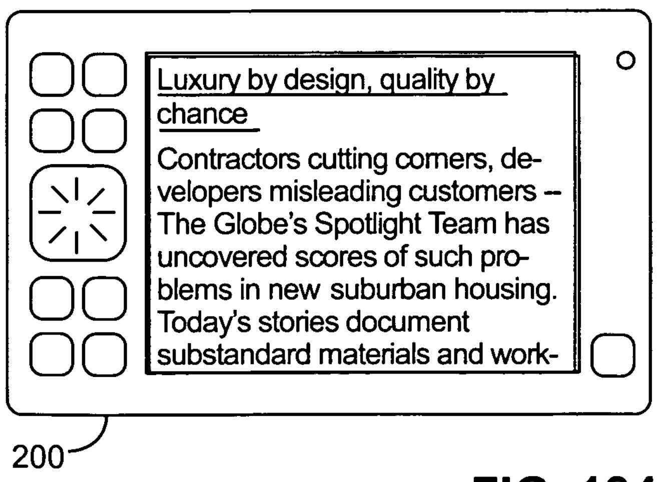
FIG. 132



Luxury by design, quality by
chance

Contractors cutting corners, de-
velopers misleading customers –
The Globe's Spotlight Team has
uncovered scores of such pro-
blems in new suburban housing.
Today's stories document
substandard materials and work-

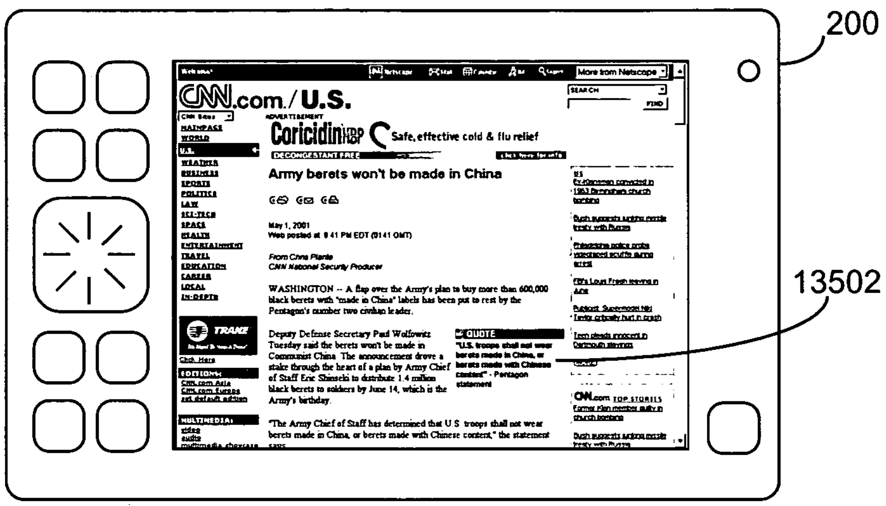
FIG. 133



Luxury by design, quality by
chance

Contractors cutting corners, de-
velopers misleading customers –
The Globe's Spotlight Team has
uncovered scores of such pro-
blems in new suburban housing.
Today's stories document
substandard materials and work-

FIG. 134



Army berets won't be made in China

May 1, 2001
Web posted at 9:41 PM EDT (0141 GMT)

From Chris Plante
CNN National Security Producer

WASHINGTON -- A flap over the Army's plan to buy more than 600,000 black berets with "made in China" labels has been put to rest by the Pentagon's number two civilian leader.

Deputy Defense Secretary Paul Wolfowitz Tuesday said the berets won't be made in Communist China. The announcement drove a stake through the heart of a plan by Army Chief of Staff Eric Shinseki to distribute 1.4 million black berets to soldiers by June 14, which is the Army's birthday.

"U.S. troops shall not wear berets made in China, or berets made with Chinese content" - Pentagon statement

"The Army Chief of Staff has determined that U.S. troops shall not wear berets made in China, or berets made with Chinese content," the statement says.

FIG. 135

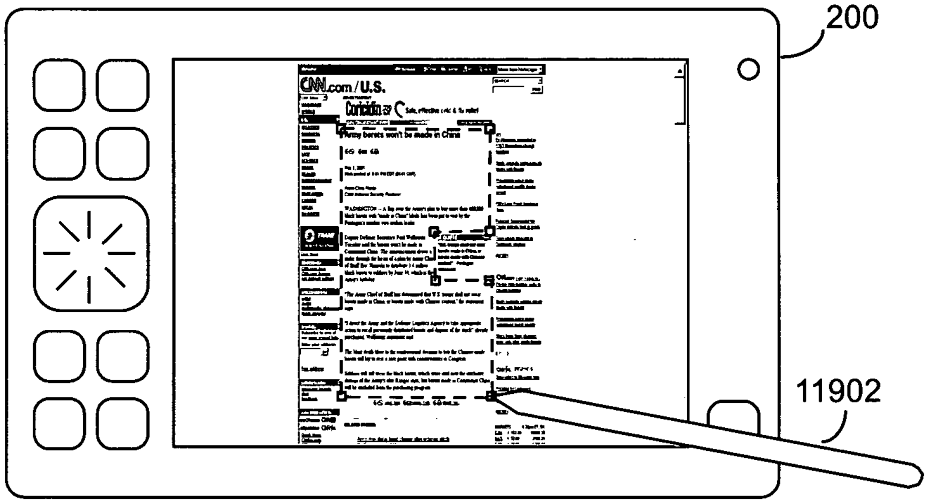
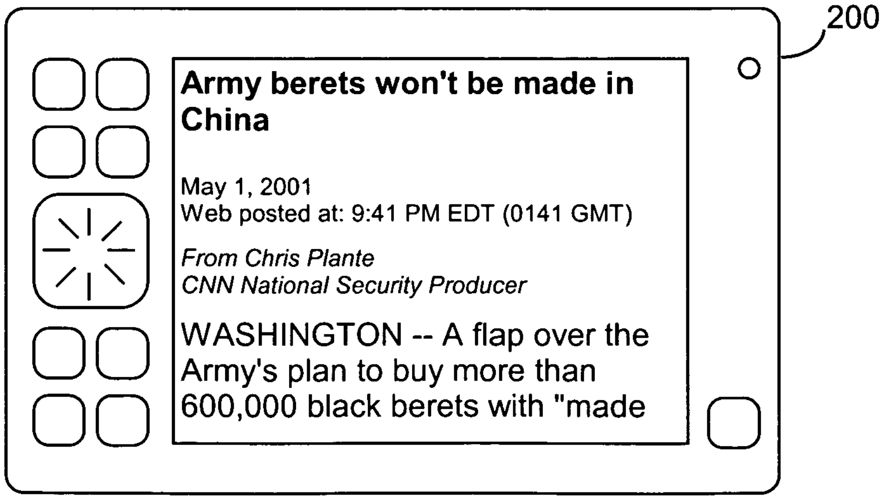


FIG. 136



Army berets won't be made in China

May 1, 2001
Web posted at: 9:41 PM EDT (0141 GMT)

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CNN National Security Producer

WASHINGTON -- A flap over the Army's plan to buy more than 600,000 black berets with "made

FIG. 137

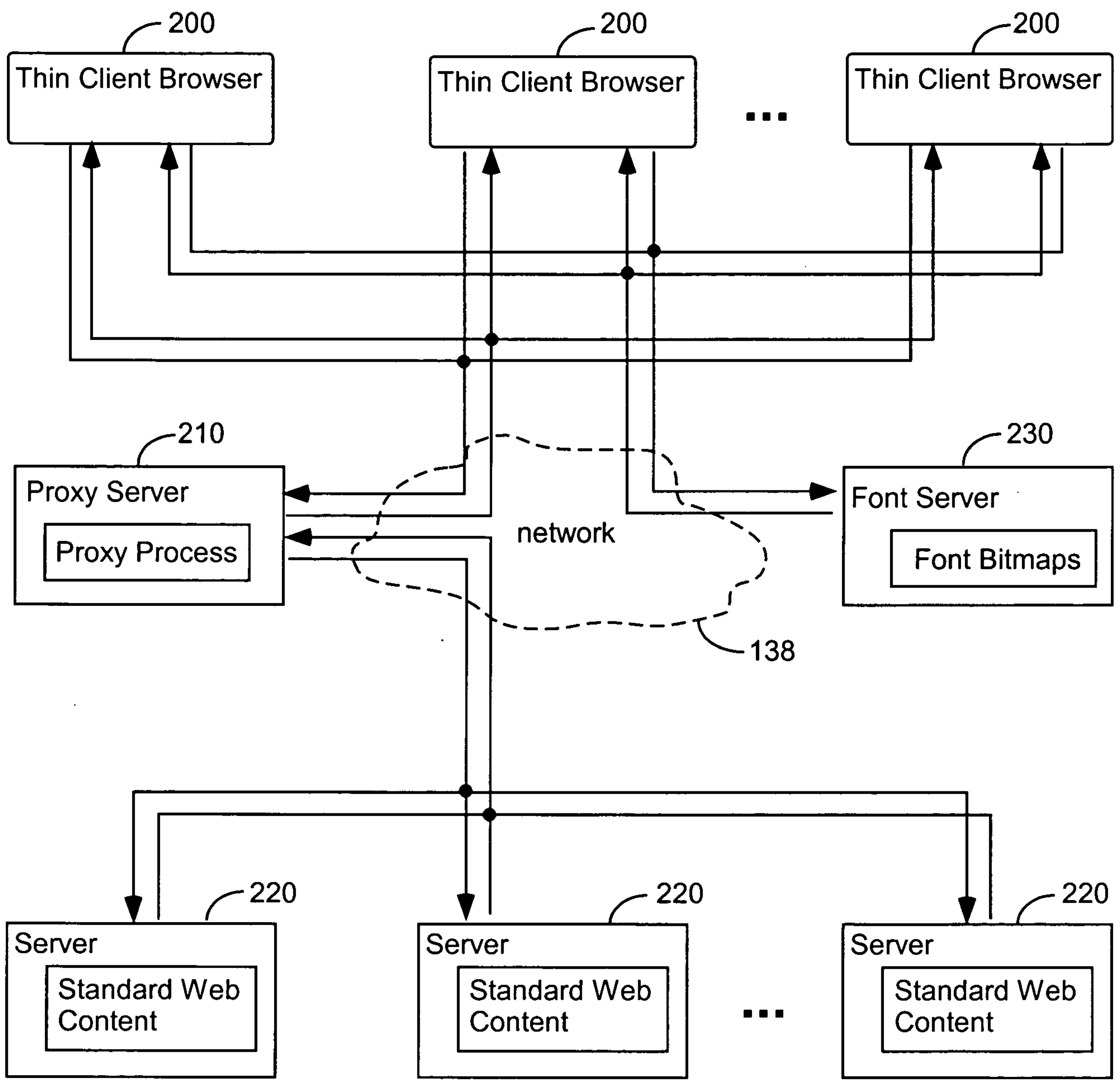
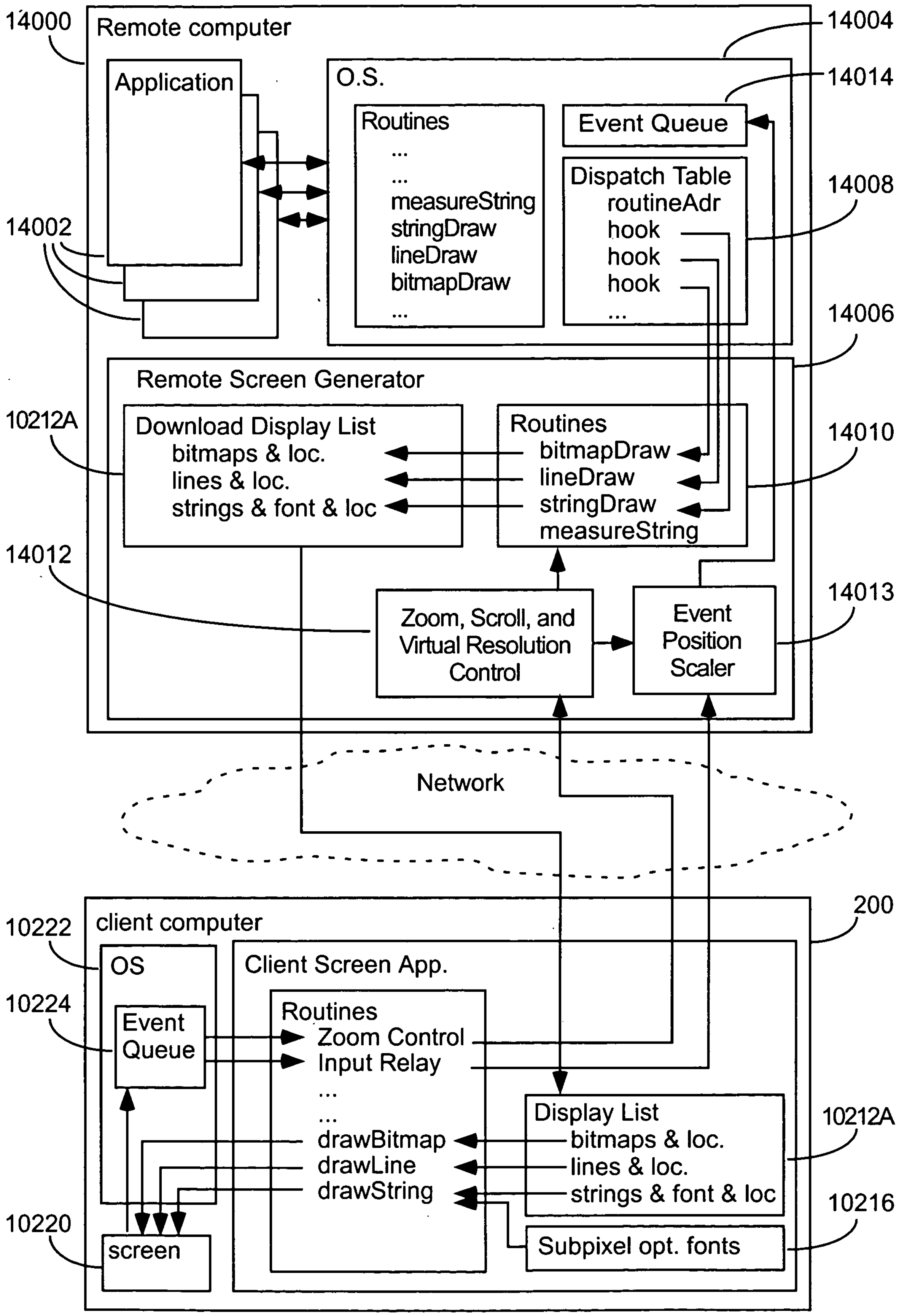

200
Thin Client Browser
200
Thin Client Browser
...
200
Thin Client Browser
210
Proxy Server
Proxy Process
network
230
Font Server
Font Bitmaps
138
Server
Standard Web Content
220
Server
Standard Web Content
220
...
Server
Standard Web Content
220

FIG. 138

```
-font server code~13900
    -if receive http request for one or more characters of a font~13902
        -if there is a font file matching having path name spacified in http
        request~13904
            -send that file over network in an http response to network
            address from which the font request came~13906
            -charge account associated with transaction~13908
        -else if font request is for a font bitmap~13910
            -generate font bitmap file having attributes indicated for font by
            path name, including~13912
                -if font request specifiestaht a subpixel optimazed version
                of the font is desired~13914
                    -generates subpixel optimized font of character
                    using non-linear color balancing~13916
                -...
            -send that file over network in an http response to the requesting
            address~13918
            -cache the font bitmap file at address corresponding to path name
            specified in request~13920
            -charge account associated with transaction~13922
```

FIG. 139



14000
Remote computer
14004
Application
O.S.
14014
Routines
...
...
measureString
stringDraw
lineDraw
bitmapDraw
...
Event Queue
Dispatch Table
routineAdr
hook
hook
hook
...
14008
14002
14006
Remote Screen Generator
10212A
Download Display List
bitmaps & loc.
lines & loc.
strings & font & loc
Routines
bitmapDraw
lineDraw
stringDraw
measureString
14010
14012
Zoom, Scroll, and Virtual Resolution Control
Event Position Scaler
14013
Network
client computer
200
10222
OS
Client Screen App.
10224
Event Queue
Routines
Zoom Control
Input Relay
...
...
drawBitmap
drawLine
drawString
Display List
bitmaps & loc.
lines & loc.
strings & font & loc
10212A
Subpixel opt. fonts
10216
10220
screen

FIG. 140

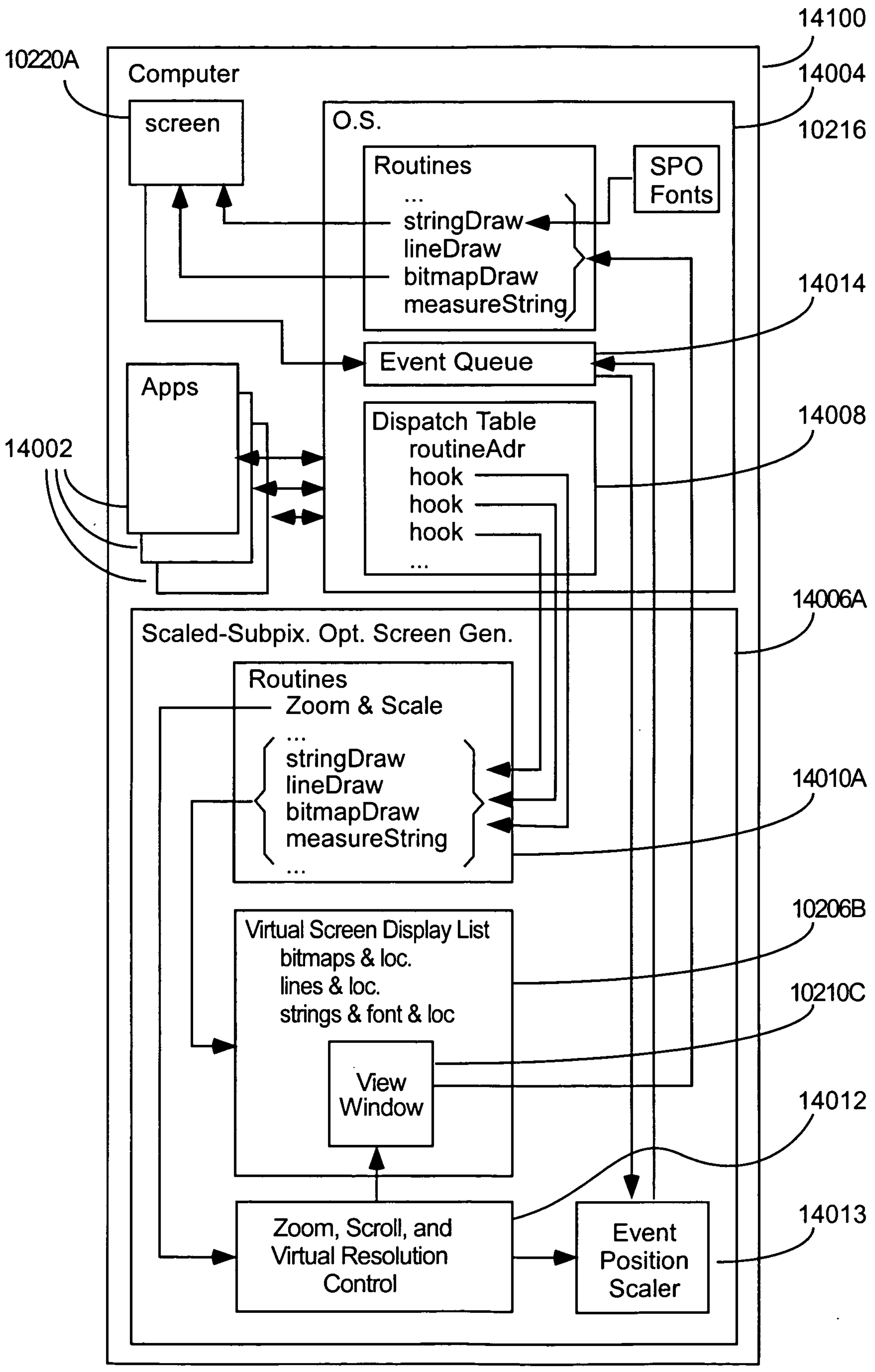

14100
10220A
Computer
screen
14004
O.S.
10216
Routines
...
stringDraw
lineDraw
bitmapDraw
measureString
SPO Fonts
14014
Event Queue
Apps
14002
Dispatch Table
routineAdr
hook
hook
hook
...
14008
14006A
Scaled-Subpix. Opt. Screen Gen.
Routines
Zoom & Scale
...
stringDraw
lineDraw
bitmapDraw
measureString
...
14010A
Virtual Screen Display List
bitmaps & loc.
lines & loc.
strings & font & loc
10206B
10210C
View Window
14012
Zoom, Scroll, and Virtual Resolution Control
Event Position Scaler
14013

FIG. 141

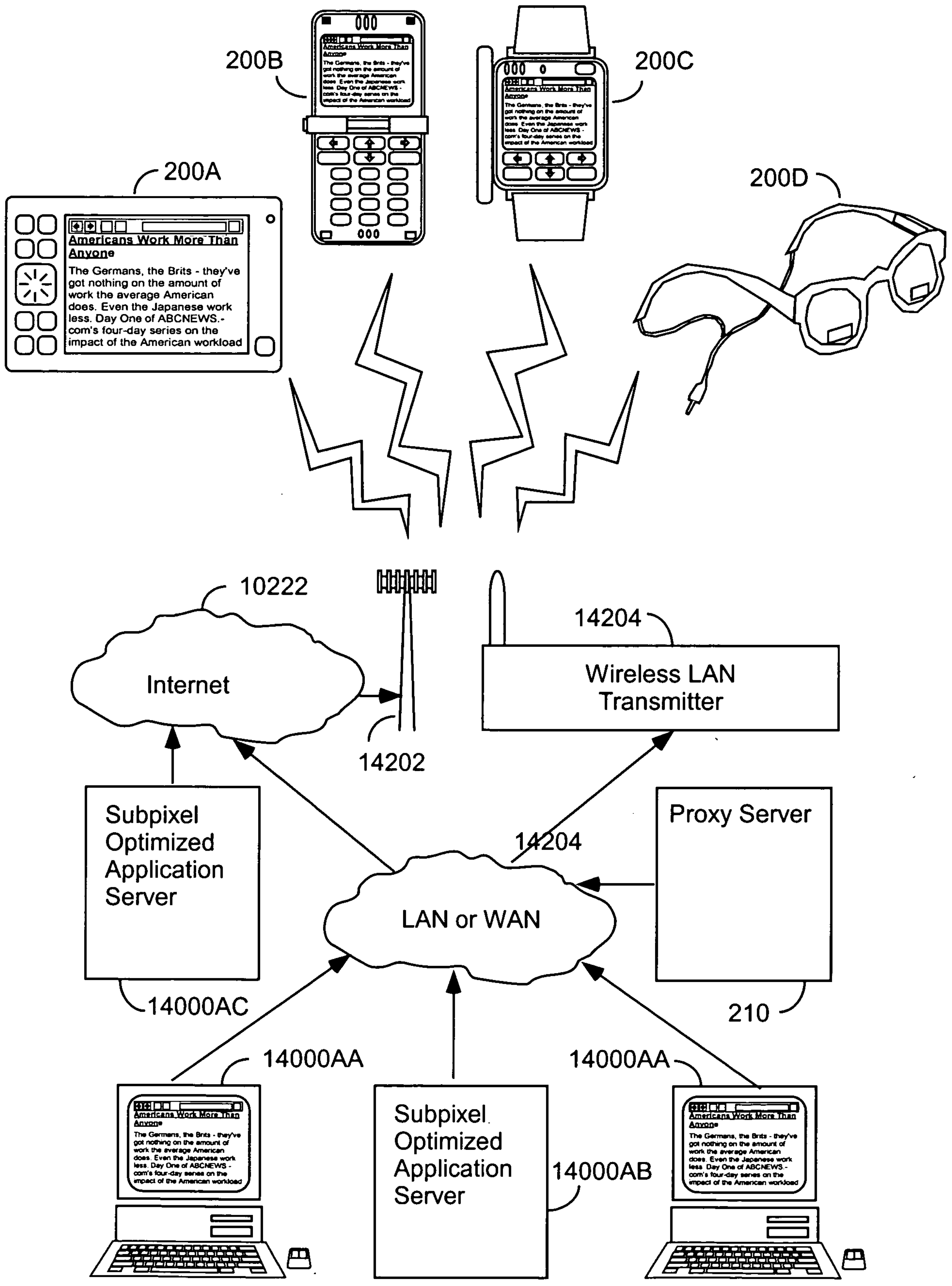
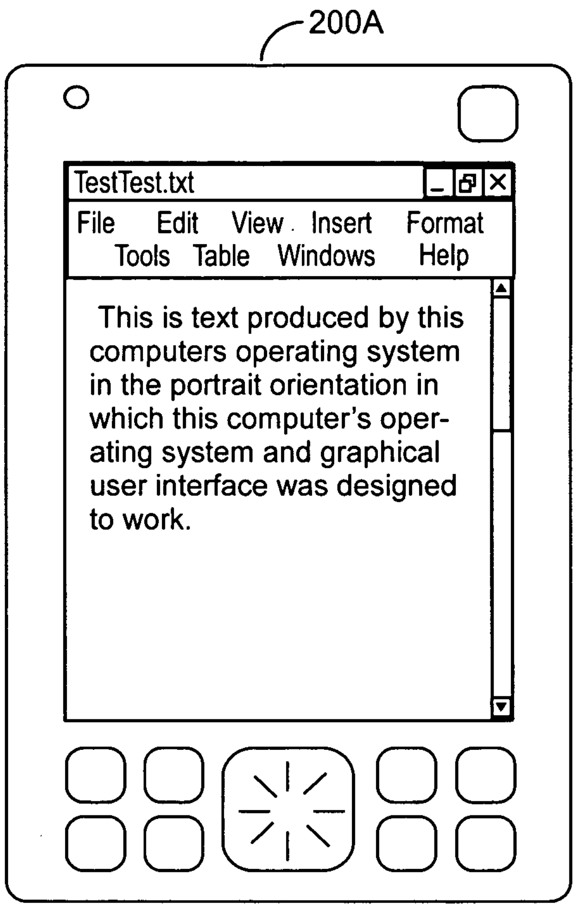
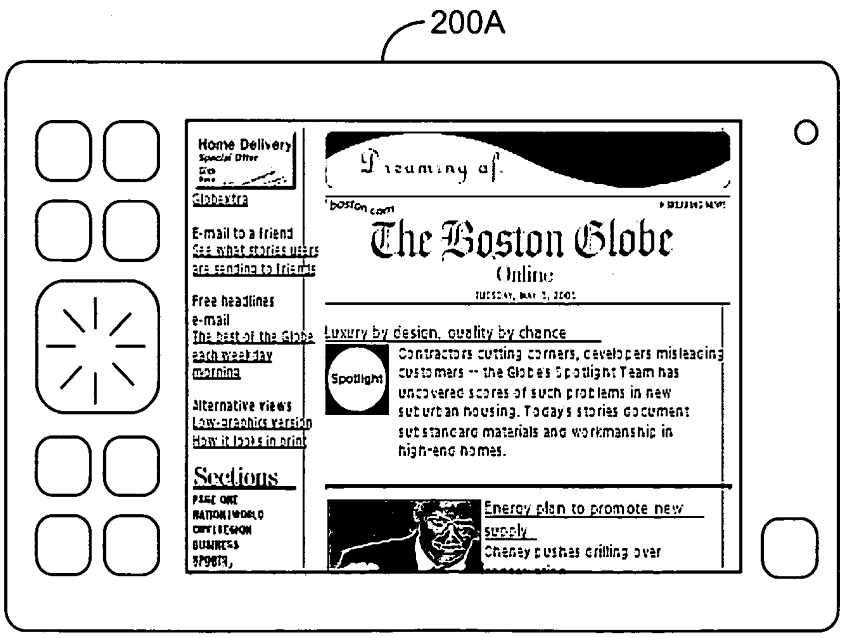

200B
200C
200A
200D
Americans Work More Than Anyone
The Germans, the Brits - they've got nothing on the amount of work the average American does. Even the Japanese work less. Day One of ABCNEWS.-com's four-day series on the impact of the American workload
10222
Internet
14202
14204
Wireless LAN Transmitter
Subpixel Optimized Application Server
14000AC
14204
LAN or WAN
Proxy Server
210
14000AA
14000AA
Subpixel Optimized Application Server
14000AB

FIG. 142



This is text produced by this computers operating system in the portrait orientation in which this computer's operating system and graphical user interface was designed to work.

FIG. 143



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How it looks in print

PAGE ONE
NATION | WORLD
CITY | REGION
BUSINESS
SPORTS,

Luxury by design, quality by chance

Contractors cutting corners, developers misleading customers -- the Globe's Spotlight Team has uncovered scores of such problems in new suburban housing. Today's stories document substandard materials and workmanship in high-end homes.

Energy plan to promote new supply

Cheney pushes drilling over

FIG. 144

```
-rectanglleCmd~14500
    -draw rectangle with screem position, height, and width defined with higher
    resolution than  screen pixel resolution, using bicolor subpixel optimization and
    using current background color~14502
```

FIG. 145

```
-downloading web applets which creates subpixelized elements on screen~14600
    -server and/or proxy~14602
        -in response to request for media from thin client download media
        including applets~14608

    -client~14604
        -request media~14606
        -receive media including applet~14610
        -load and run applet~14612
        -applets draw subpixel optimized elements to subpixel addressable
        screen on client~14614
```

FIG. 146

```
-subpixel optimization of 3-d animations~14900
    -for each of successive frame times~14902
        -run 3-d animation engine to create bitmap of current frame, or at least of
        those portions of image which have changed since the last frame, at a
        higher resolution than the resolution at which subpixel-optimized images
        will be displayed~14904
        -scale-down and subpixel optimize frame bitmap, or at least of changes
        in it since the last frame~14906
        -display scaled-down subpixel optimized frame bitmap, or at least scaled
        subpixel optimized bitmaps of changed portion of frame~14908
```

FIG. 149

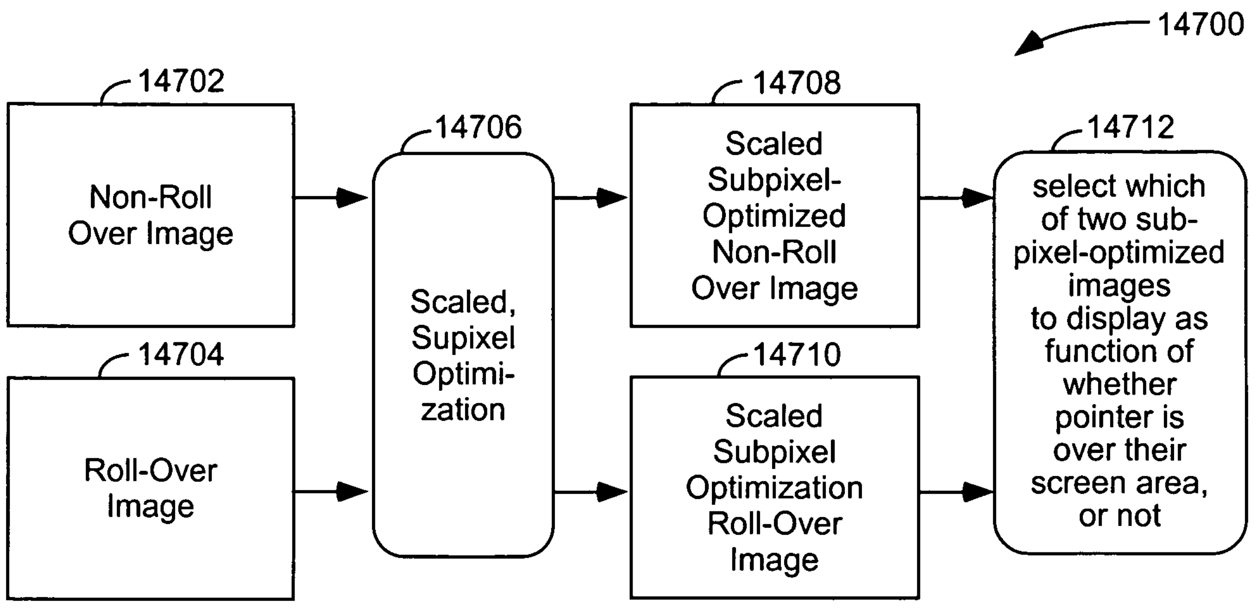

14700
14702
Non-Roll Over Image
14704
Roll-Over Image
14706
Scaled, Supixel Optimi-zation
14708
Scaled Subpixel-Optimized Non-Roll Over Image
14710
Scaled Subpixel Optimization Roll-Over Image
14712
select which of two sub-pixel-optimized images to display as function of whether pointer is over their screen area, or not

FIG. 147

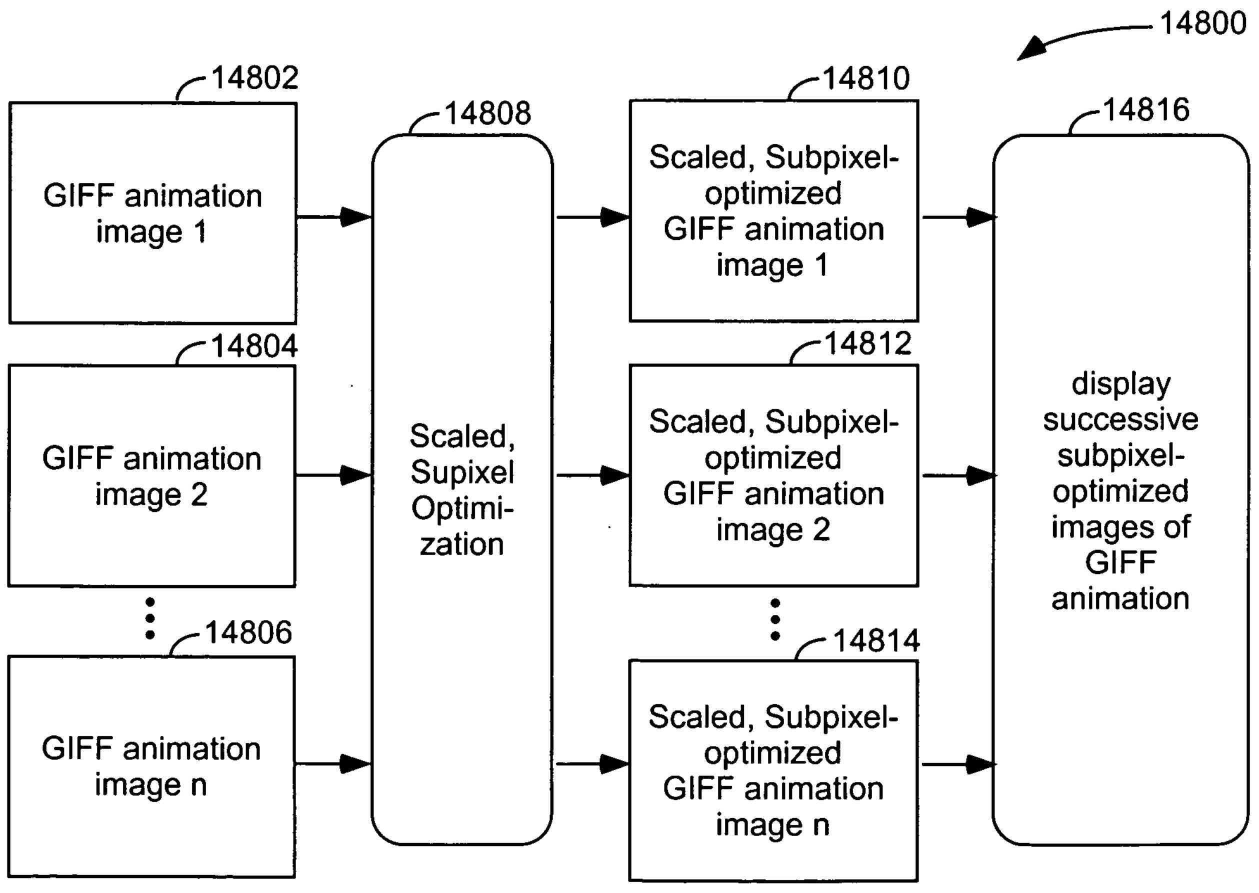

14800
14802
GIFF animation image 1
14804
GIFF animation image 2
14806
GIFF animation image n
14808
Scaled, Supixel Optimi-zation
14810
Scaled, Subpixel-optimized GIFF animation image 1
14812
Scaled, Subpixel-optimized GIFF animation image 2
14814
Scaled, Subpixel-optimized GIFF animation image n
14816
display successive subpixel-optimized images of GIFF animation

FIG. 148

```
-game server computer~15000

    -if have receive user input from one or more game client computers~15002
        -feed it to game engine~15004
    -...
    -have game engine compute display list for current frame (or changes to display
    list for current frame)~15006
    -have 3-d rendering routine render bitmap frame of current display list(or current
    changes to display list) at higher resolution than that at which corresponding
    subpixel-optimized bitmaps will be shown~15008
    -scale-down and subpixel optimizie current frame bitmap(or bitmaps of current
    changes to frame and their scaled down locations)~15010
    -...
    -compress one or more successive scaled-down subpixel optimized bitmaps
    (and their locations) ~15012
    -download compressed, scaled, subpixel-optimized animation frames (or
    changes and their locations) to game client~15014
```

FIG. 150

```
-game client~15100
    -...
    -receive downloaded images (and screen locations)~15101
    -decompress animated images (and screen locations)~15102
    -displays the scaled, subpixel optimized animation frame bitmaps (or change
    bitmaps at their respective positions)~15104
    -if have received any user input~15106
        -upload user input to game server~15108
    -...
```

FIG. 151

```
-subpixel optimization of images with transparency maps~15200
    -produce scaled, either a bicolor or multicolor subpixel-optimized bitmap of the
    foreground image~15202
    -produce a correspondingly scaled, bicolor subpixel optimized bitmap of the
    images transparency map~15204
    -display foreground image's bitmap on a subpixel optimized display
    including:~15206
        -for each pixel row of the displayed image~15208
            -for each subpixel of such row~15210
                -set currentAlpha to the alpha value of the corresponding
                subpixel of the transparency map~15212
                -set the luminosity of the current subpixel to currentAlpha
                times the luminosity of the corresponding subpixel of the
                foreground image plus (1 – currentAlpha) times the prior
                luminosity value of the current subpixel~15214
```

FIG. 152

```
-subpixel optimizing video having interpolation between keyframes~15300
    -decompress video~15302
    -scale and subpixel optimizing key frames~153040
    -scale but do not subpixel optimize interpolated changes between keyframes
    because of its rapid speed~15306
    -display scaled video on subpixel addressable display with subpixel optimized
    keyframes and non-subpixel optimized interframe interpolation~15308
```

FIG. 153

```
-subpixel optimizing video representing changes to portions of frame~15400
    -decompress video~15402
    -scale and subpixel optimizing frames~15404
    -scale and subpixel optimize change bitmaps, scale their location relative to
    frame~15406
    -repeatedly display on subpixel addressable display~15407
        -any scaled, subpixel optimized video frame followed by a sequence of
        one or more scaled subpixel optimized change bitmaps over the bitmap
        of that frame at corresponding scaled positions on the frame~15408
```

FIG. 154

```
-moving images with fixed subpixelation~15500
    -store subpixel-optimized bitmap of image~15502
    -for each successive frame time~15503
        -calculate movement of image at fixed size and orientation, rounding
        location to nearest horizontal and vertical whole pixel location~15504
        -display image at that location~15506
```

FIG. 155

```
-moving image with changing subpixelation~15600
    -store high resolution source image~15602
    -for each successive frame time~15603
        -calculate translation, rotation, and/or transformation of high resolution
        source~15604
        -generate scale-down and subpixel optimized bitmap of image with
        images mapping into subpixel grid associated with bitmap being a
        function of its tranlation, rotation, and/or transformation~15606
        -display resulting subpixel optimized bitmap on subpixel display~15608
```

FIG. 156

```
-subpixel optimazation  of DVD video~15700
    -decompress DVD video to a resolution higher than that at which it is to be
    displayed in subpixel optimized image~15702
    -scale and supixel optimize decompressed bitmaps of video images~15704
    -display scaled subpixel optimized bitmaps of video images on subpixel
    addressable display~15706
```

FIG. 157

```
-subpixel optimization of HDTV~15800
    -decompress HDTV video to a resolution higher than that at which it is to be
    displayed in subpixel optimized image~15802
    -scale and supixel optimize decompressed bitmaps of video images~15804
    -display scaled subpixel optimized bitmaps of video images on subpixel
    addressable display~15806
```

FIG. 158

-subpixel optmization of mpeg4~15900
  - -receive and decompress mpeg4 video~15902
  - -use bicolor subpixel optimization with non-linear color balance in scaling down of bicolor objects~15904
  - -use multi-color subpixel optimization in scaling down of non-bicolor objects~15906
  - -display combination of bicolor and multicolor objects on subpixel optimized display moving subpixel optimized objects relative to screen~15908

FIG. 159

-server subpixel optimization of scaled down, downloaded video~16000
  - -receives request for video and specification of subpixel display resolution~16002
  - -receives requested video content~16004
  - -scales down and subpixel optimizes the received video to subpixel resolution association with request~16006
  - -compresses video~16008
  - -downloads it to requesting device~16010

FIG. 160

-proxy subpixel optimization of scaled down, downloaded video~16100

  - -proxy computer code~16100
    - -when receive request for video (and specification of subpixel resolution)~16102
      - -send corresponding request for the requested video to a server~16103
    - -when receive requested video content~16104
      - -scale down and subpixel optimizes video (to specified subpixel resolution)~16106
      - -compress subpixel optimized video~16108
      - -download it to thin client~16110

  - -thin client code~16112
    - -in response to user input, send request for video to proxy (including subpixel resolution at which video is to be displayed)~16113
    - -when receive requested video from proxy~16114
      - -decompress video~16115
      - -display scaled-down decompressed video on subpixel addressable display~16116

FIG. 161

```
-Electronic ink code~16200
    -if user enters electronic ink input~16202
        -record strokes as series of points and curves or lines in between~16204
        -draw ink on screen using subpixel optimization of lines and curves with non-linear color balance~16206
    -if user selects to scale up representation of electronic ink~16208
        -produce subpixel optimized bitmap of ink's lines and curves using bicolor subpixel optimization with non-linear color balancing at the selected scaled up size~16210
        -display scaled up image~16212
    -if user selects to scale down representation of electronic ink~16214
        -to produce subpixel optimized bitmap of ink's lines and curves using bicolor subpixel optimization with non-linear color balancing at the selected scaled down size~16216
        -display scaled down image~16218
```

FIG. 162

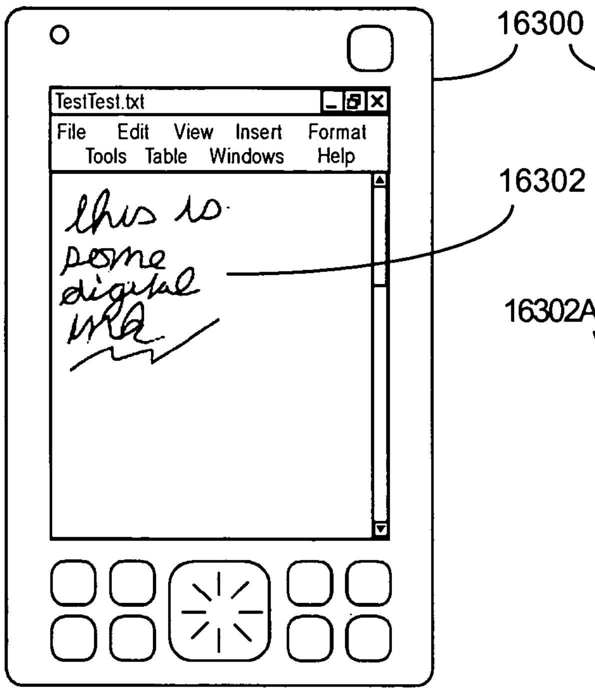


FIG. 163

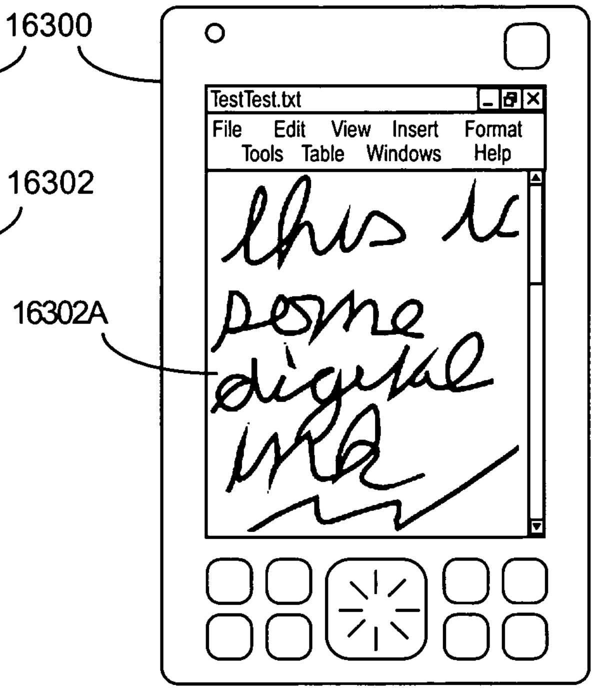


FIG. 164

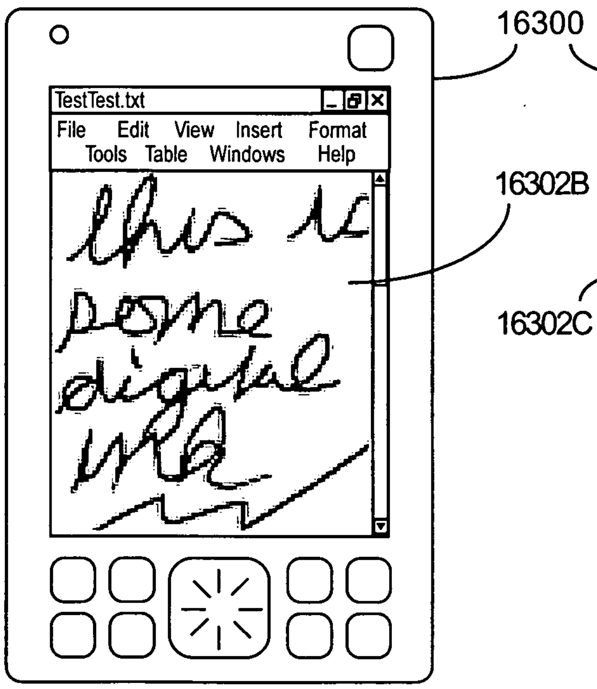


FIG. 165

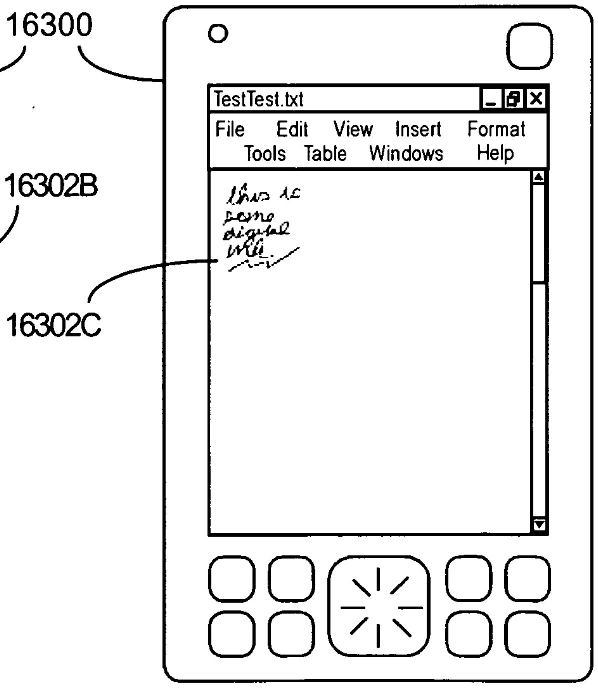


FIG. 166

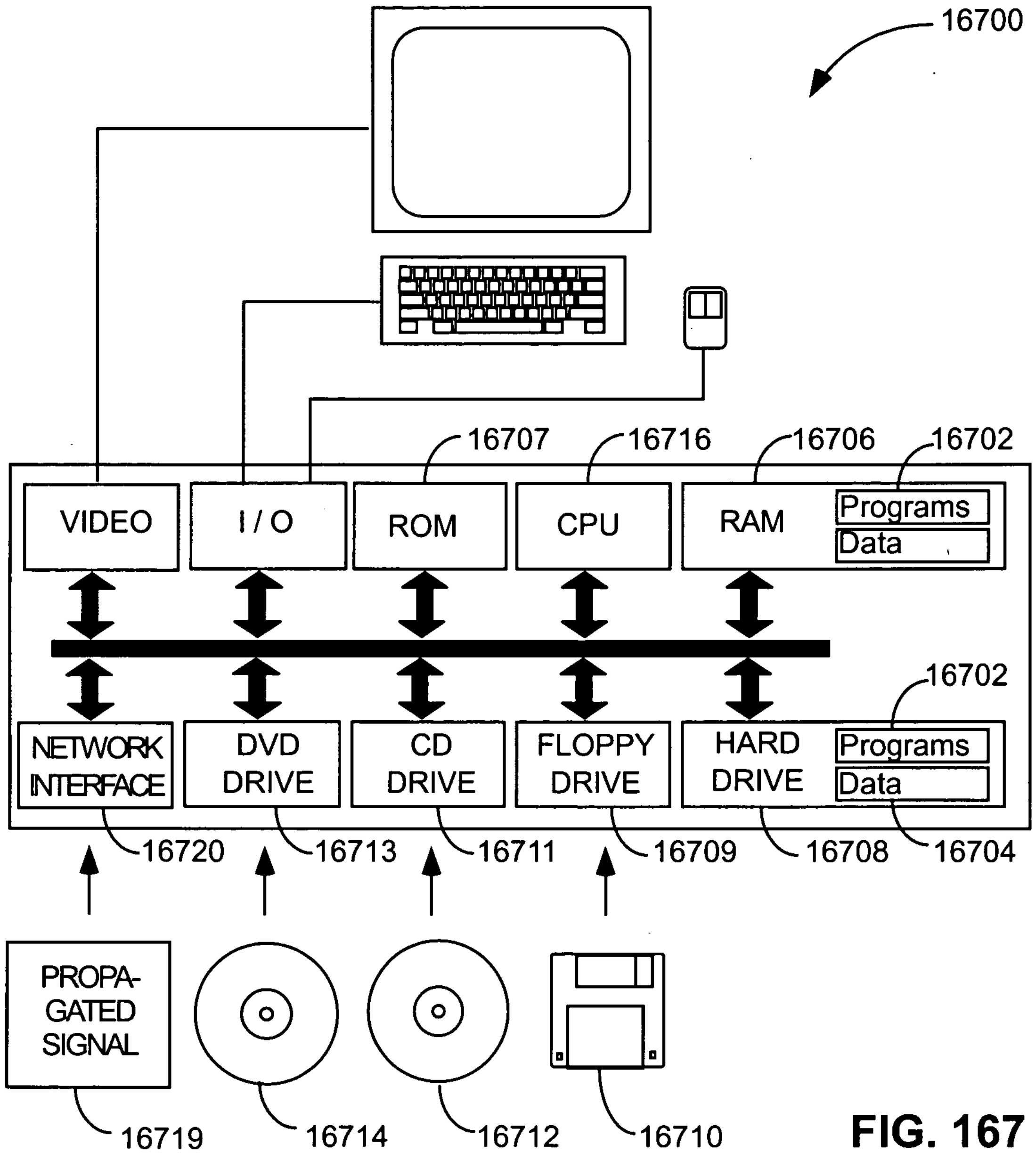
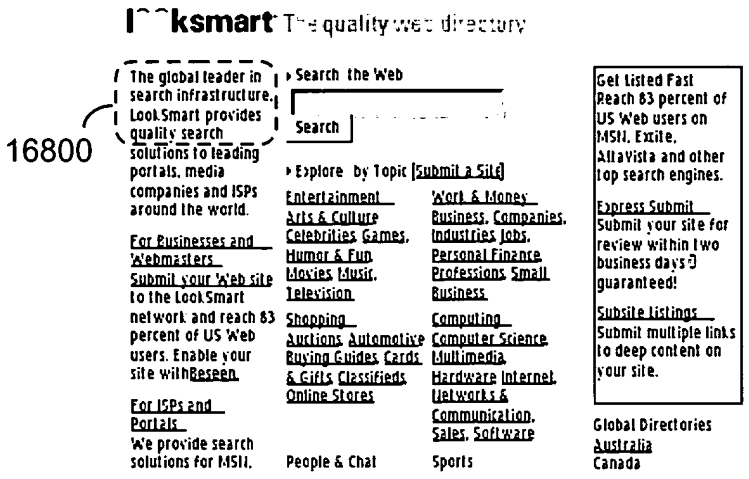

16700
16707
16716
16706
16702
VIDEO
I / O
ROM
CPU
RAM
Programs
Data
16702
NETWORK INTERFACE
DVD DRIVE
CD DRIVE
FLOPPY DRIVE
HARD DRIVE
Programs
Data
16720
16713
16711
16709
16708
16704
PROPA-GATED SIGNAL
16719
16714
16712
16710

FIG. 167



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Search

▸ Explore by Topic [Submit a Site]

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Arts & Culture Celebrities Games, Humor & Fun Movies Music, Television	Business, Companies, Industries Jobs, Personal Finance Professions Small Business
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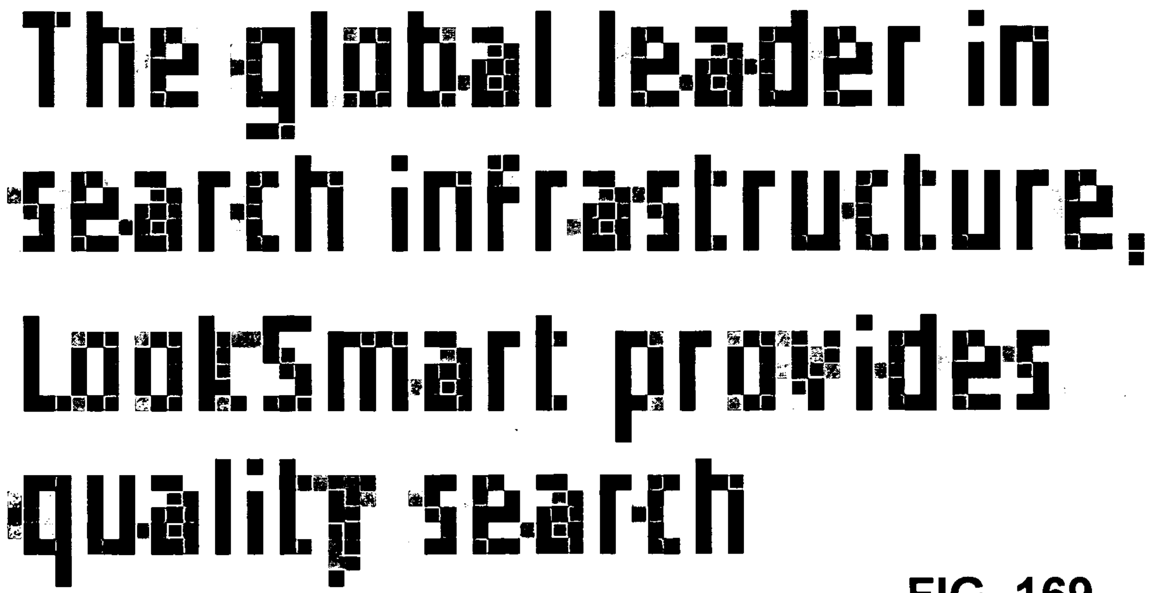
Submit your site for review within two business days guaranteed!

Subsite Listings
Submit multiple links to deep content on your site.

Global Directories
Australia
Canada

FIG. 168



The global leader in search infrastructure. LookSmart provides quality search

FIG. 169

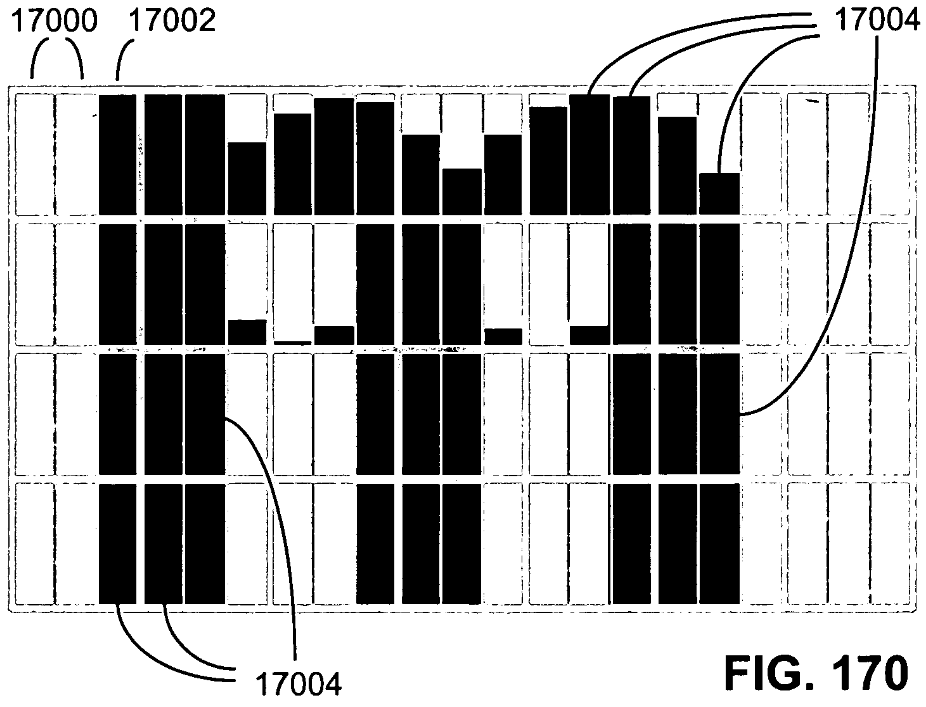


FIG. 170

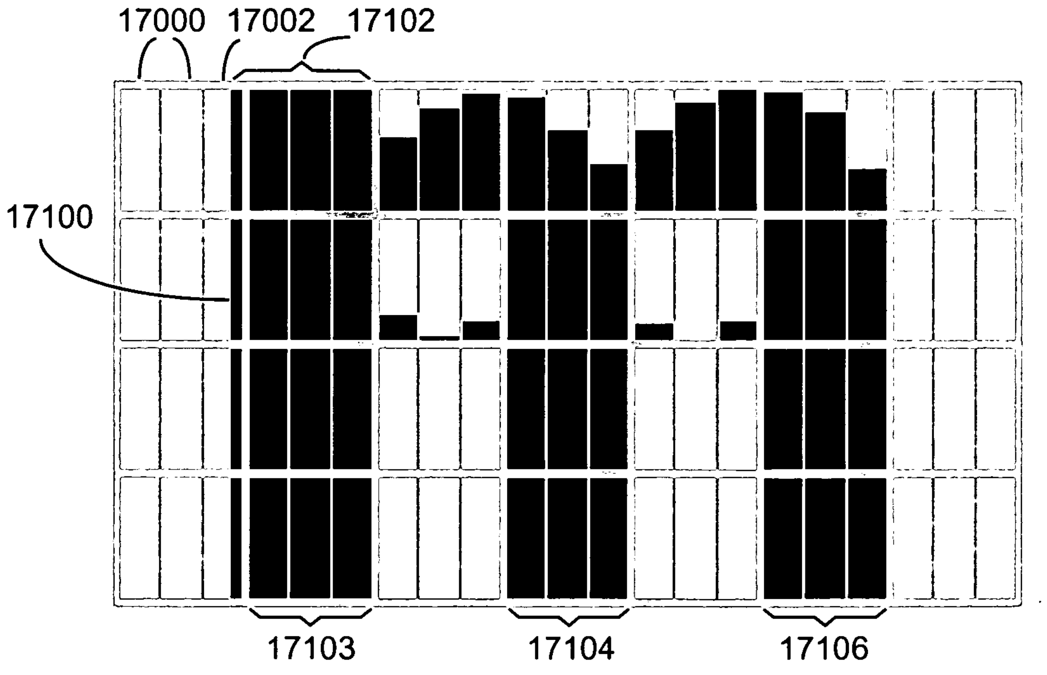
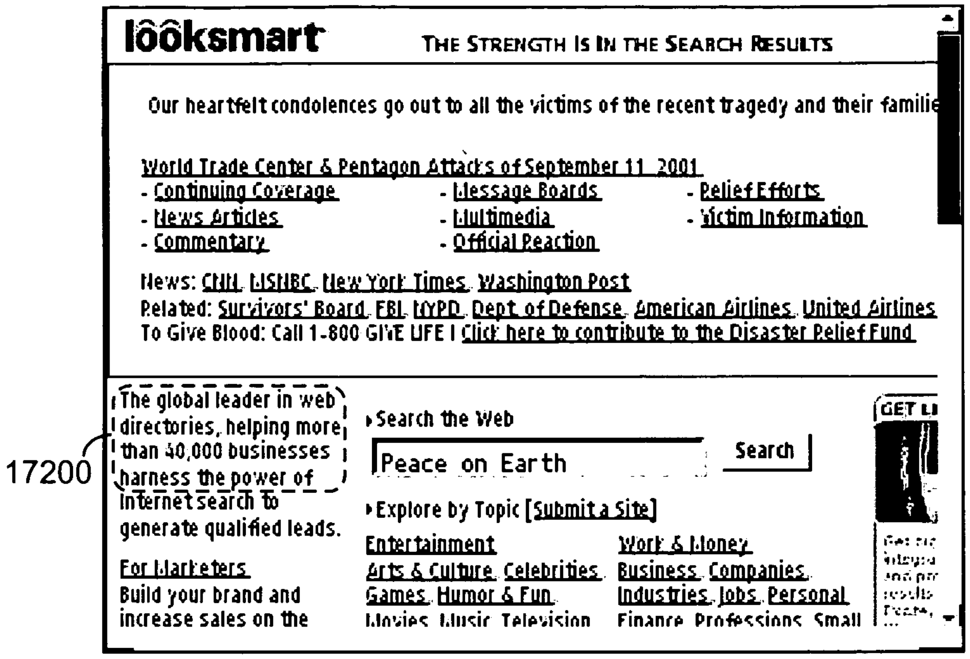


FIG. 171



lôôksmart THE STRENGTH IS IN THE SEARCH RESULTS

Our heartfelt condolences go out to all the victims of the recent tragedy and their famili

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- News Articles - Multimedia - Victim Information
- Commentary - Official Reaction

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Related: Survivors' Board FBI NYPD Dept of Defense American Airlines United Airlines
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For Marketers
Build your brand and increase sales on the

FIG. 172

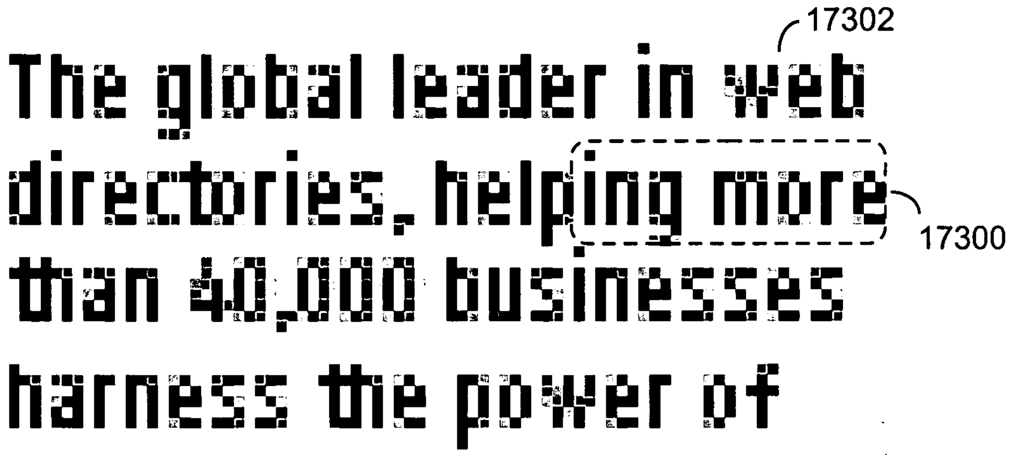


FIG. 173

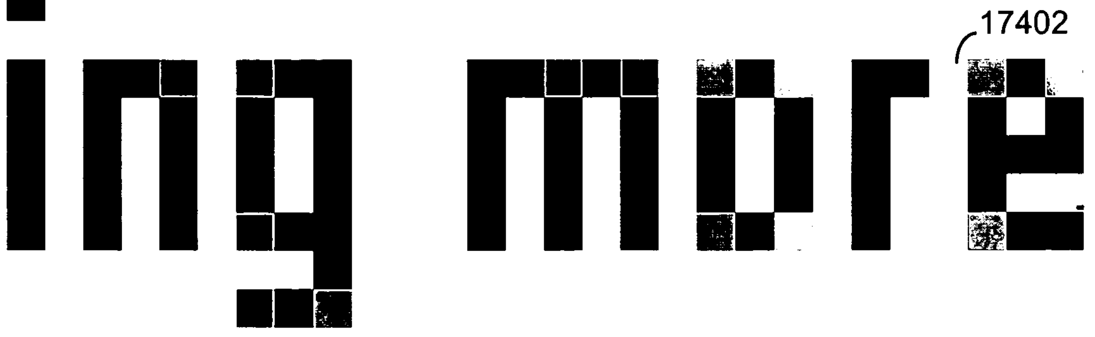


FIG. 174

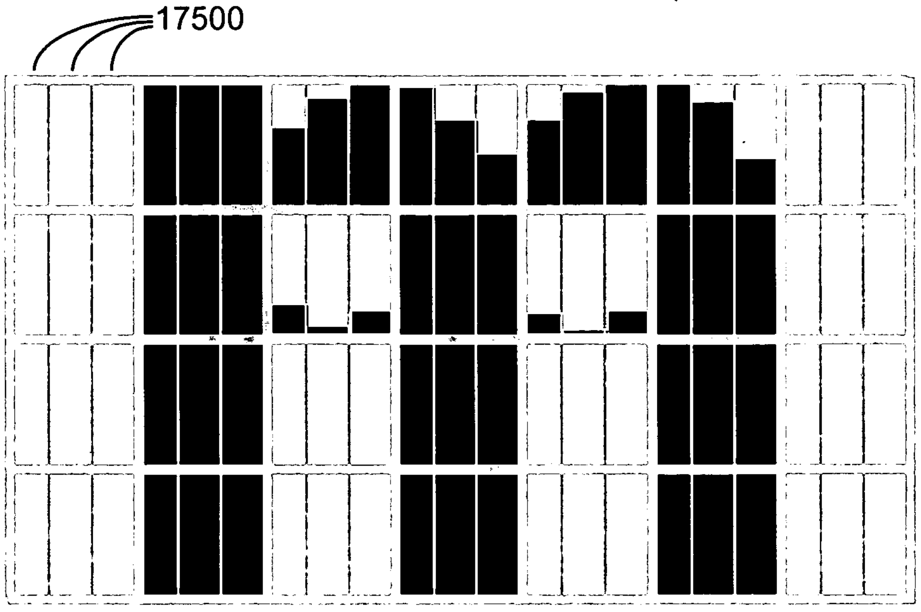
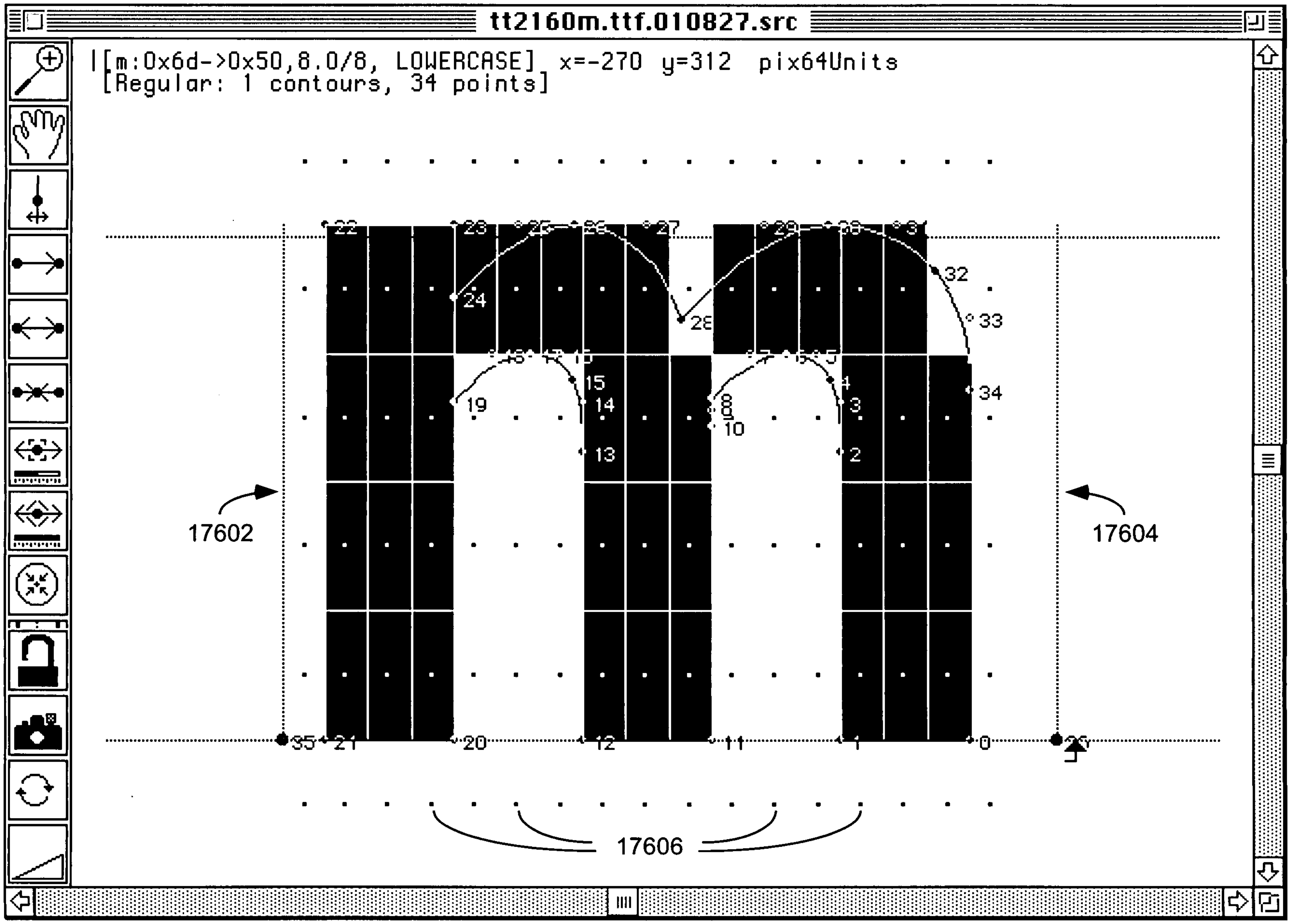


FIG. 175


tt2160m.ttf.010827.src

|[m:0x6d->0x50,8.0/8, LOWERCASE] x=-270 y=312 pix64Units
[Regular: 1 contours, 34 points]

FIG. 176

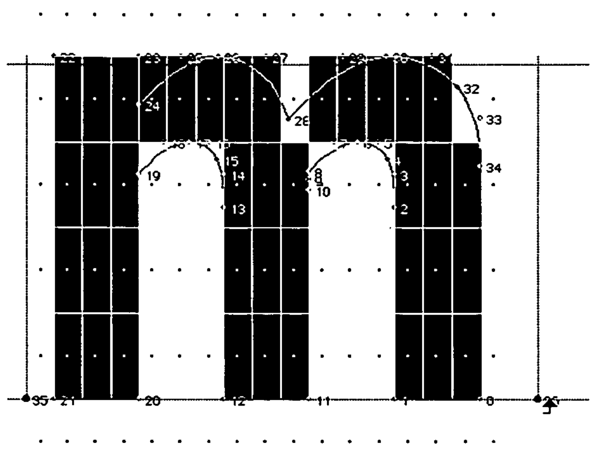


FIG. 177

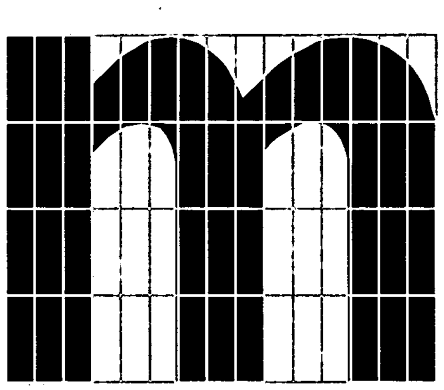


FIG. 178

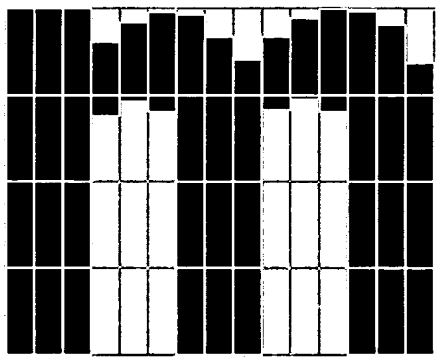


FIG. 179

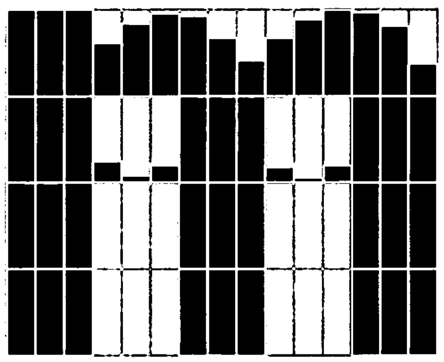


FIG. 180

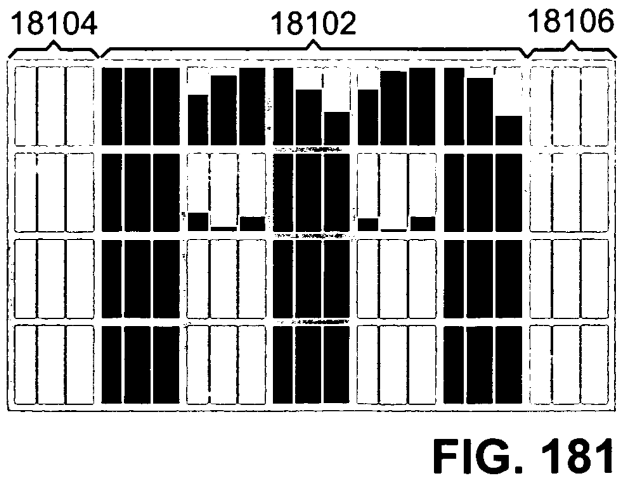


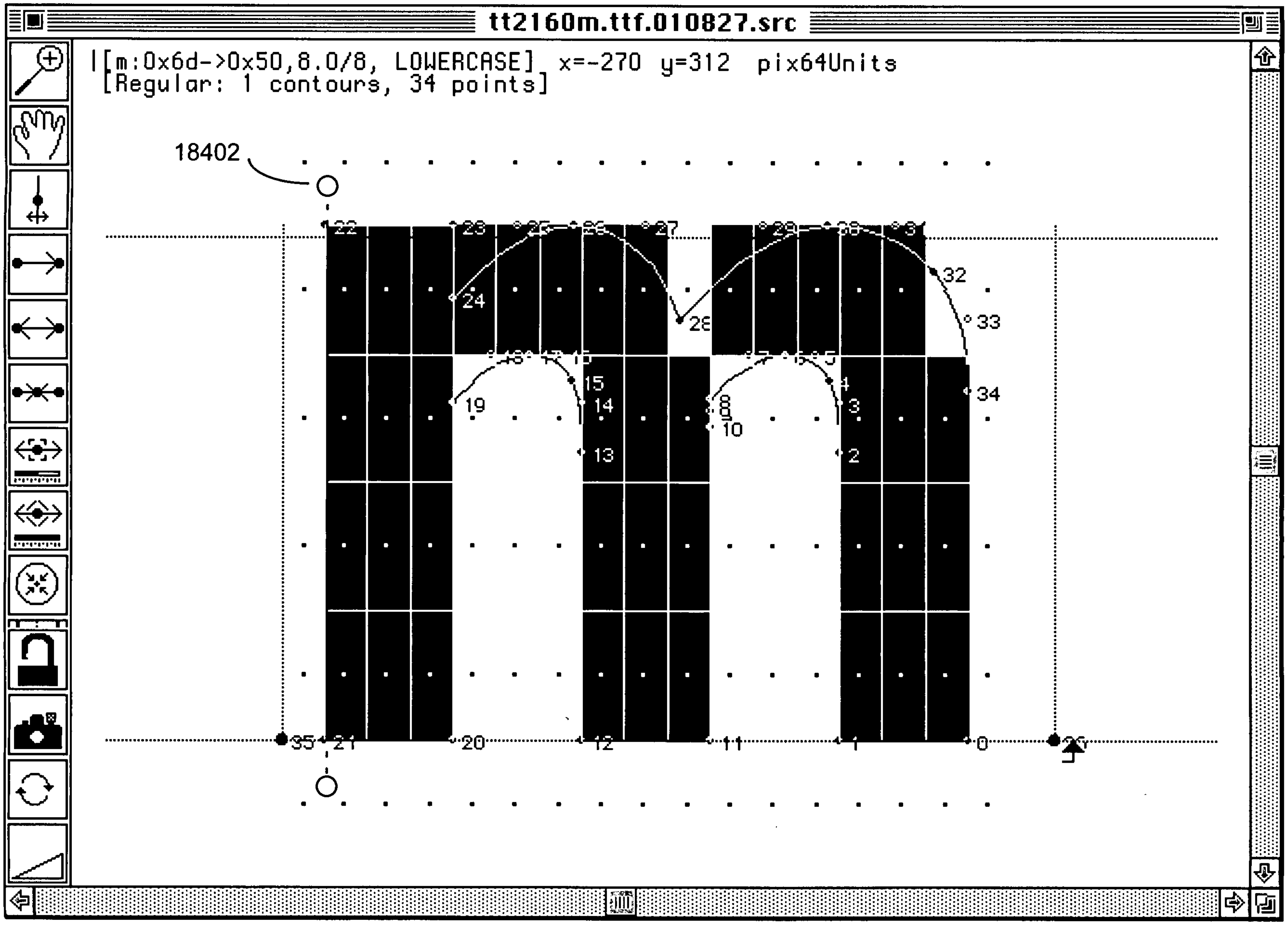
FIG. 181

```
-subpixel optimized font bitmaps with non-linear color balance~6000A
    -determine tightest rectangular array of rasterazition units into which character
    font shape fits, taking into account alignment of character-font shape relative to
    raterization units due to hinting18202
    -for each pixel row~6002A
        -for each subpixel in a row~6004
            -determine a coverage value representing the percent of the
            subpixel which is covered by the font shape~6006
    -map resulting array of subpixel coverage values into an array of subpixel
    addressable pixels, aligning first column of rasterization units with leftmost
    subpixel of a pixel row~18204
    -pad array with pixel column comprised of three subpixel's each to left~18206
    -pad array with two, three, or four more sub-pixel columns to right, so as to
    cause the total number of sub-pixel columns to be an even multiple of
    three~18208
    -adjust left and right side bearing values to compensate for padding subpixel
    column on left and right side of bitmap~18210
    -perform non-linear color balancing~18212
    -convert to packed color value pixel bitmap~18214
```

FIG. 182

```
-drawing character string~18300
    -set pen position to start position for string~18302
    -for each character of string to be displayed~9714A
        -access its associated font bitmap~9716
        -set character start position to pen position~18304
        -adjust pen position by left side bearing~18306
        -for each pixel value of the font bitmap~9718
            -if pixel is non-zero, draw pixel18308
        -set pen position to character start position plush current character's
        advance width~18310
```

FIG. 183



tt2160m.ttf.010827.src

|[m:0x6d->0x50,8.0/8, LOWERCASE] x=-270 y=312 pix64Units
[Regular: 1 contours, 34 points]

FIG. 184

```
-selected text reflow~18500
    -access web page's contents~18502
    -perform first layout of web page's contents, placing text at different horizontal
    locations as indicated by web page~18504
    -display elements of web page at positions determined by the first layout~18506
    -enable user to select a portion of text at a given horizontal location in display of
    first layout~18508
    -respond to user selection of such a portion of text by~18510
        -performing a second layout of the selected text by re-flowing it in a new
        column, at a different font size relative to new column's width~18512
        -displaying layout of new column at scale that fills at least two thirds of
        width of screen~18514
```

FIG. 185

```
-zoom to fit~18600
    -access web page's contents~18602
    -perform layout of web page's contents~18604
    -display all or portion of layout at first scale~18606
    -enable user to drag pointing device across first scale layout display; ~18608
    -if drag continues across screen boundary ~18610
        scroll onto screen portions of layout at first scale previously off
        screen~18612
    -if drag is released~18614
        -define selected layout part based on position in first scale layout display
        of start and end of drag ~18616
    -display selected part of layout at second scale that fits selected layout part to
    screen. ~18618
```

FIG. 186

```
-drag scroll ~18700
    -access web page's contents~18702
    -perform layout of web page's contents~18704
    -display all or portion of layout~18706
    -enable user to drag a pointing device across display of layout~18708
    -responding to any such drag across a boundary associated with a screen edge
    by scrolling onto screen, past the screen edge, portions of layout previously off
    screen~18710
```

FIG. 187

```
-clickzoom~18800
    -access web page's contents~18802
    -perform layout of web page's contents~18804
    -display all or portion of layout at first scale~18806
    -enable user to click a pointing device at a selected location in display of layout
    at first scale~18808
    -responding to such a click by performing a zoomed display of portion of layout
    around selected location~18810
```

FIG. 188

```
-zoomclick~18900
    -access web page's contents~18902
    -perform layout of web page's contents~18904
    -display all or portion of layout at first scale on touch screen~18906
    -if user presses touch screen at first position in first scale layout display~18908
        -replace first scale layout display with a display at larger scale of portion
        of layout that includes first position at substantially same position on
        screen as in first scale layout display~18910
        -display cursor slightly above location of touch~18912
        -respond to any movement of touch by correspondingly moving cursor on
        display at second scale~18914
        -respond to any movement of touch across a boundary associated with a
        screen edge by scrolling onto screen, past the screen edge, portions of
        layout at second scale previously off screen~18916
        -if user subsequently releases of press at a selected position in second
        scale layout display~18918
            -act as if a mouse click had occurred at corresponding position
            relative to web page~18920
            -replace second scale layout display with first scale layout
            display~18922
```

FIG. 189

```
-zoom out with greeking~19000
    -access web page's contents~19002
    -perform layout of web page's contents~19004
    -if user has selected given larger display scale~19006
        -display portion of web page's layout at larger scale, including~19008
            -representing layout's images with bitmap images scaled for
            display at larger scale~19010
            -representing layout's strings by bitmap images composed of font
            bitmaps sized for display at larger scale~19012
    -if user has selected given smaller display scale~19014
        -display portion of web page's layout at smaller scale, including~19016
            -representing layout's images with bitmap images scaled for
            display at smaller scale~19018
            -representing layout's strings by bitmaps composed of a greeked
            text representation designed to indicate size and location of each
            such string at smaller scale~19020
```

FIG. 190